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ABSTRACT

In child-centered education programs, children construct their own knowledge from their experiences and interactions with the world around them, and teachers foster children's growth and development by building on children's interests, needs, and strengths within a safe and caring environment. The Step by Step educational partnership developed a series of child-centered teaching manuals for caregivers and teachers in early childhood programs in Central and Eastern Europe. Initially directed at the preschool level, the series has been extended from birth to age 10. This manual (for 6- and 7-year-olds) builds on the series' child-centered preschool program and provides primary grade teachers with lessons, suggestions for extended activities, assessment strategies and forms, thematic curriculum webs, and complete resource and reference lists. The manual's contents are: (1) "Part 1: Presenting the Step by Step Primary Program," includes educating for the 21st century, goals for the program, developmental guidelines, character development, classroom management in the child-centered classroom, ongoing assessment, and family participation; (2) "Part 2: Implementing the Step by Step Primary Program," including distinctive characteristics, literacy, visual arts, mathematics, science, and social studies; and (3) "Part 3: Unifying the Learning Experience," includes integrated learning and an example thematic unit of study on bread. Contains 21 references. (EV)

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CREATING CHILD-CENTERED CLASSROOMS

KATE BURKE WALSH
FOREWORD BY PAMELA A. COUGHLIN

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STEP BY STEP

A PROGRAM FOR CHILDREN AND FAMILIES

CREATING CHILD-CENTERED CLASSROOMS

KATE BURKE WALSH

FOREWORD BY
PAMELA A. COUGHLIN

The Soros Foundations/Open Society Institute is a network of foundations, programs, and institutions established and supported by philanthropist George Soros to foster the development of Open Societies around the world, particularly in the former communist countries of Central and Eastern Europe and the former Soviet Union. To this end the Soros Foundation cooperates with Children's Resources International to develop and implement the project called Step by Step: A Program for Children and Families.

CRI, a nonprofit organization located in Washington, D.C., promotes the implementation of sound educational practices developed in the United States while maintaining the cultural traditions of the nineteen participating countries.

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FOREWORD

This book is one component of a pioneering process to redefine education systems, undertaken in nineteen emerging democracies of Central and Eastern Europe and countries of the former Soviet Union by the Open Society Institute and Children's Resources International. The Step by Step Preschool Program began in September 1994, growing from 250 classrooms to over 1,500 in 1996. The Step by Step Preschool Program has been accepted by the Ministries of Education as an alternative model in nineteen countries.

The Step by Step Primary Program is the next step in continuing opportunities for democratic education in primary schools. The impetus for this primary program grew from the response of the parents and staff involved in the Step by Step Program for three- to five-year-olds. These educators recognized the success of the preschool program and understood the implications for learning at the next level of education. Simultaneously, parents and teachers voiced hopes of continuing a child-centered program for the children who were leaving the Step by Step Preschool Program and scheduled to move into the traditional classroom for six- and seven-year-olds.

Expansion to primary school marks significant growth of the Step by Step Program. It builds on the philosophy and concepts inherent in the Preschool Program: family participation, individualization and classroom curriculum, designed around activity centers.

Respecting and preserving the educational tradition and standards of participating countries, the Step by Step Program offers a methodology that is based on the philosophy of the preschool model. The practices contained in this document are designed to guide teachers and all those involved with young children in the educational process.

We hope that this document affirms the hard work of the many Step by Step Preschool teachers, trainers, country directors, and parents who have been leaders in establishing a "new way" to help children and adults grow and learn. We offer these new methods as a continuation of the vision to educate future generations for active participation in open societies.

Pam Coughlin
Children's Resources International

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ACKNOWLEDGMENTS

> *The bottom line in the work of my foundations is to empower people who will make the sacrifices necessary to build open societies and who will care for and protect the freedoms they obtain for coming generations.*
>
> George Soros

Thanks to the vision and support of Mr. Soros, we at Children's Resources International (CRI) have been part of this building process by offering a new educational model to the future generations of open societies.

Liz Lorant has broadened the vision of the project to include children and families in primary school. We are delighted to be able to expand on the philosophy and goals that have been so successful in kindergarten classes in Europe. Our adventure now moves to a new and even greater challenge. We embark in a true partnership with our country teams from 19 countries: Albania, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kazakhstan, Kyrghystan, Lithuania, Macedonia, Moldova, Romania, Russia, Slovakia, Slovenia, Ukraine, Yugoslavia. This partnership continues its hard work and dedication to the basic concepts of the Step by Step Program as we present a new methodology to the primary schools.

We are awed by the perspective that our Soros counterpart Liz brings to this work. She sees the big picture and clearly articulates the path to follow. We will continue to work to make her dream a reality.

The other member of our Soros team is Sarah Klaus. She has worked tirelessly to help us put all of the pieces of the picture together. She both designs the mosaic and then fills in the gaps. We appreciate all of her support and extreme attention to details.

The collective support that our country teams receive from the network of hardworking people in the Soros Foundation offices is immeasurable. We truly appreciate all they continue to do to make the Step by Step Program successful.

The good humor, dedication, and tireless energy demonstrated by the CRI executive team, under the leadership of Pam Coughlin, provided indispensable support for this project. An affectionate thank you is extended to Pam, Julie Empson, Kris Hansen, and Roxane Kaufmann.

We extend a sincere thank you to the following people for their expertise in writing content area chapters:

Amy Dickson — Classroom Management in the Child-Centered Classroom
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Karen Langford — Mathematics
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Carol Seefeldt — Social Studies
Anne Marie Desaulniers — Thematic Unit of Study: Bread
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A special thanks goes to Paula Carreiro, the faculty, and staff of Beauvoir School for their support of this project as a training site for visiting European educators. All the photos in the book are courtesy of Beauvoir School, Washington, DC.

We are especially pleased with the illustrations done by Jean Iker and extend our thanks.

We hold the work of the Northeast Foundation for Children in Massachusetts in high regard. A footnote is not sufficient credit for the contribution that their work has made to Chapter III. Their influence was substantial and we are grateful.

Marie Keefe and Cappie Morgan, our editors, provided insight and skill in designing and editing this document. Cathy Fink of CDF Services patiently and tirelessly helped make it look as crisp as it does. We thank you.

Kate Burke Walsh

INTRODUCTION

Part One introduces the Step by Step Primary Program. Chapter I presents the philosophical overview, rationale, and theoretical basis and also describes the unifying concepts and expectations. Chapter II presents educational goals in content areas such as mathematics, literacy, science, social studies, and art. These general goals serve as standards in the Step by Step Program. In Chapter III, developmental guidelines are presented and discussed. Helping children develop a sense of values and strong character is the topic of Chapter IV. Chapters V and VI are designed to inform teachers about the ideas of assessment and classroom management. They offer numerous practices and examples.

Chapter VII extends the idea of parent participation in the primary grades. A variety of ways parents can stay involved in their children's classes and schools are represented, along with the philosophical commitment to a continued partnership with parents.

Part Two includes Chapter VIII on Distinctive Characteristics that are the cornerstones on which the content areas are built. Chapters IX-XIII discuss the content areas of Literacy, Visual Arts, Mathematics, Science, and Social Studies and provide Sample Lesson Plans for teachers to implement the Step by Step Primary Program.

In Part Three, the learning experience is unified through Integrated Learning, briefly introduced in Chapter XIV. Chapter XV describes thematic units of study and presents a comprehensive unit using bread as a theme through which all content areas can be taught.

Creating Child-Centered Classrooms provides teachers with lessons, suggestions for extending activities, assessment strategies and forms, thematic curriculum webs, and, complete resource and reference lists. The book was written by teachers for immediate classroom application.

PART ONE:

PRESENTING THE STEP BY STEP PRIMARY PROGRAM

EDUCATION FOR THE 21ST CENTURY

I. EDUCATING FOR THE TWENTY-FIRST CENTURY

Do not confine your children to your own learning
For they were born in another time.
Hebrew Proverb

Overview of the Step by Step Primary Program Model

A firm belief in the principles of democracy underlies the Step by Step programs for children. Both the preschool and primary programs encourage children to become active citizens and to appreciate the values inherent in a democratic way of life. Teachers guide them in making choices and taking personal responsibility for those choices. Children in democratic classrooms are encouraged to formulate and express their own opinions. Questions are solicited. Discussions are promoted. The Step by Step Primary Program values mutual respect, responsibility between adults and children, honesty, caring, and diligence. Adults intentionally model these characteristics in their daily interactions with children. The characteristics are the basis for character development in the Step by Step Primary Program.

The Step by Step Primary Program model adheres to the philosophy, principles, and practices familiar from the Step by Step Preschool model. It includes a continued commitment to:

- Family participation
- Developmentally appropriate practices which take into account the whole child
- A child-centered approach to teaching based on individualization
- Activity centers in classrooms
- Ongoing training and technical support for teachers

The Step by Step Primary Program is a model created as a thoughtful response to dramatic changes in society. The need for change in education is compelling as we consider the flood of information into everyday life, the shifting of the roles of traditional institutions, and current findings about they way the brain functions. It contrasts dramatically with the factory model of education. In traditional factories, products are manufactured on an assembly line, done according to precise schedules, and the final product is the combination of readily identifiable parts that are made using prescribed materials and methods. Since the industrialized era began, the factory has provided a model for schools world-wide. The daily classroom structure is scheduled in prescribed bits of time for specific subjects. Information is separated into distinct fragments that are presented to children in a time frame designed to cover the material, not designed as a response to the child's desire for knowledge. The content is predetermined, as are outcomes; they are defined by skills and facts which are easy to test. In both factories and schools, decisions about content and outcomes are made by individuals who are given authority to evaluate the work. Children and teachers are on the lower most rungs of a clearly defined hierarchy and do not have that authority. Decision making is not shared with teachers and there is little interconnectedness of content. (Adapted from Caine and Caine Making Connections)

> *In effect, schools operate as though the most crucial aspect of education is the information content that they purport to teach students. Schools concentrate on memorization. The products are the facts that students memorize (Caine & Caine, 1991, p. 13).*

That model fails to prepare children for success in the 21st century for two reasons. First, the jobs of the future will be those that assembly-line robots cannot do. It has been suggested that 75% of the jobs for the next century have not yet been invented. The creation and implementation of these positions calls for highly sophisticated and creative intelligence. As Caine and Caine (1991) state, "The words that come to mind are not stable and predictable, as indicative of a segmented, controlled factory workplace, but rather fluid and dynamic. A fragmented and assembly-line education actually inhibits an understanding of the link between subjects that is essential for complex learning." This is the second point of failure: its content and methods do not take into account new information about the way the brain functions and learning takes place.

The authors of the Step by Step Primary Program define the most urgent task as the need to create a new educational model that will make each child aware, beginning in the first year of school, that all of life is interdependent. We have drawn on the works of many in creating this document: leaders in the field of cognitive psychology, and researchers in brain development, social sciences, and education. Our aim is to fuse the best of what we know from European and American educational philosophies in order to develop educational practices which honor the individual as a creative thinker in an interdependent world.

Learning is the key to success in the future. Carl Sagan (1977) states:

> *As a consequence of the enormous social and technological changes of the last few centuries, the world is not working well. We do not live in traditional and static societies. But governments, in resisting change, act as if we did. Unless we destroy ourselves utterly, the future belongs to those societies that, while not ignoring the reptilian and mammalian parts of our being, enable the characteristically human components of our nature to flourish; to those societies that encourage diversity rather than conformity; to those societies willing to invest resources in a variety of social, political, economic and cultural experiments, and prepared to sacrifice short-term advantage for long-term benefit; to those societies that treat new ideas as delicate, fragile and immensely valuable pathways to the future (pp. 203-204).*

Unifying Concepts and Goals

By the end of the first year, the Step by Step Primary Program will expose children to four powerful concepts which are central to the design of the Step by Step model and methodologies: communication, caring, community, connections. *Communication* is the key concept for teaching skills and information in literacy, including reading, writing, speaking, listening, spelling; visual arts; and mathematics. *Caring* is the theme that provides the impetus for the study of science, including life science, physical, and earth science as well as character education. *Community* helps children and teachers conceptualize the interconnectedness of history, geography, and civics. *Connections*, defined as understanding the interrelatedness of life, helps children bridge new concepts from the known and develop an empathetic world view. Through these specific concepts the Step by Step Primary Program maintains four goals:

- To develop life-long learners.
- To create a learning environment based on mutual respect and democratic principles.
- To ensure developmental continuity & practices.

- To ensure that all children acquire academic, artistic, ethical and practical skills to successfully participate in a democratic society.

Expectations

Teachers in the Step by Step Primary Program help children successfully reach the stated goals by clearly communicating expectations about how to meet the goals. Children can achieve all of the goals in a variety of ways—there are many routes up the mountain. Expectations are invitations offered that assume positive behavior, not demands made by the teacher on the children. These invitations are offered in a kind, accepting manner which communicates to the children that the teacher believes in the child's ability to succeed.

The Step by Step Primary Program believes that children will assume many different roles in the classroom. It is through these different roles that children reach the established goals:

- As *thinkers* children will reflect on their actions and make connections between new and prior knowledge.
- As *problem-solvers* children will create alternative solutions to obstacles they encounter and see problems as opportunities for discovery.
- As *recorders* children will develop skills and tools for communicating their observations and ideas.
- As *listeners* children will learn to focus attention fully and become active, empathetic listeners for an audience.
- As *communicators* children will formulate and express their own ideas and opinions through a variety of mediums.
- As *organizers* children will plan their own learning and take responsibility for their decisions.
- As *partners* children will learn to cooperate and begin to take into account another's point of view.
- As *friends* children will learn to trust and care for others and come to know that they are depended on for the same.

The teacher expects this variety of roles from the child. She communicates her expectations in many ways. First, by creating an environment which provides opportunities in the classroom for the children to assume specific roles as they learn.

For example, the teacher brings to class a variety of tools and instruments for measuring. These are displayed on a shelf that is designated for "Mind Challenges" with the printed questions:

> How many ways can you and a partner measure our classroom?
> Record your results on a card to share with the class.
> Can you invent other units of measurement to use?

Each week the teacher sets out different items and questions on the Mind Challenges shelf to engage the students in problem solving and higher order thinking.

Second, the teacher literally defines roles by asking children to become "partners" for a specific activity or to become the observer, and recorder as they work on activities. Third, she communicates her expectations by modeling the kind of behavior she hopes the children will aspire to. For example, if the teacher expects the children to be thoughtful listeners, she will demonstrate the qualities she wants from the child by focusing her eyes and attention on the child as he or she speaks, giving her full attention to the speaker, listening attentively, and responding in a thoughtful, genuine manner to the child with a comment that is relevant.

The Theoretical Basis

There is no one theory that encompasses all of developmental psychology, indeed there are many. The Step by Step Primary Program draws on the ideas of many in building the theoretical basis for an effective primary school model. We include the work of Rousseau, Pestalozzi, Froebel, and Montessori; long considered the cornerstones of early childhood education, as well as contemporary models such as the British Infant School.

Three consistent themes emerge in reflecting on the numerous ideas and theories of early childhood education. First, there exists the *ethic of social reform*. In educating young children, there is the expectation for social change and improvement in the future. It is the function of the adults in a society to be hopeful about the improvement of conditions for the next generation. When this hope is accompanied by action, positive improvements can happen for children. Over time early childhood education has evolved as a comprehensive approach which involves the family, school, and community in partnership.

Second, there is the recognition of the *value of childhood*. As people recognized the importance of childhood, the quality of life for children has improved. Adults have taken more responsibility in addressing the conditions which affect children. Laws have been enacted to protect children and to provide for their health and physical welfare. Early childhood educators believe that the early years form the foundation for later development in physical, social, emotional, and cognitive domains. It is now accepted that young children need special attention because they are fundamentally different from adults. With an increasing understanding about human development and brain functioning, there has been a parallel increase in quality programs and teaching practices for children. Along with these changes, there is a new respect for childhood and children, witnessed by a wealth of programs for children unparalleled in history worldwide.

The *role of the school* and family as partners in transmitting values is the third theme which occurs throughout the numerous theories in early childhood education. What children should ultimately *do* and *be* is at the core of all child rearing practices, whether in the home or the school. The pioneers in the field of child development believed in the value of childhood and it has been transferred to the educational ideas influencing current practice. They also believed that a children's self-esteem would be enhanced if their cultural heritage was recognized. An awareness and appreciation of cultural diversity has always been a basic tenet of quality preschool programs. The Step by Step programs are dedicated to these concepts of cultural respect and strong family participation.

Our commitment to these basic principles allows for continuity as children and families move from the Step by Step Preschool Program to the Primary Program. The work of highly regarded theoreticians are the underpinnings for this program. The work of John Dewey emphasizes that personal experience is a vital component in the early development of concepts. Jean Piaget has described learning as the constant interplay between the processes of assimilation and accommodation. Learning is sensory, based in the here and now. J.M. Hunt indicates that children develop new concepts by matching prior knowledge to present experiences. Vygotsky has examined the social and cultural influences affecting language development. In his theory of social learning he asserts that new information that is acquired daily is embedded in life events which take on meaning by virtue of the relevant, complex, and highly socially interactive nature of the experiences. Jerome Bruner observes that as children manipulate their social environment, they gain the ability to communicate through language. The educational philosophy of Kaminsky focuses on keeping the child as the central point in thinking and planning education. The conceptual design of the Step by Step Primary Program is based on reliable research, a strong theoretical framework, and teaching practices of successful educators from all over the world.

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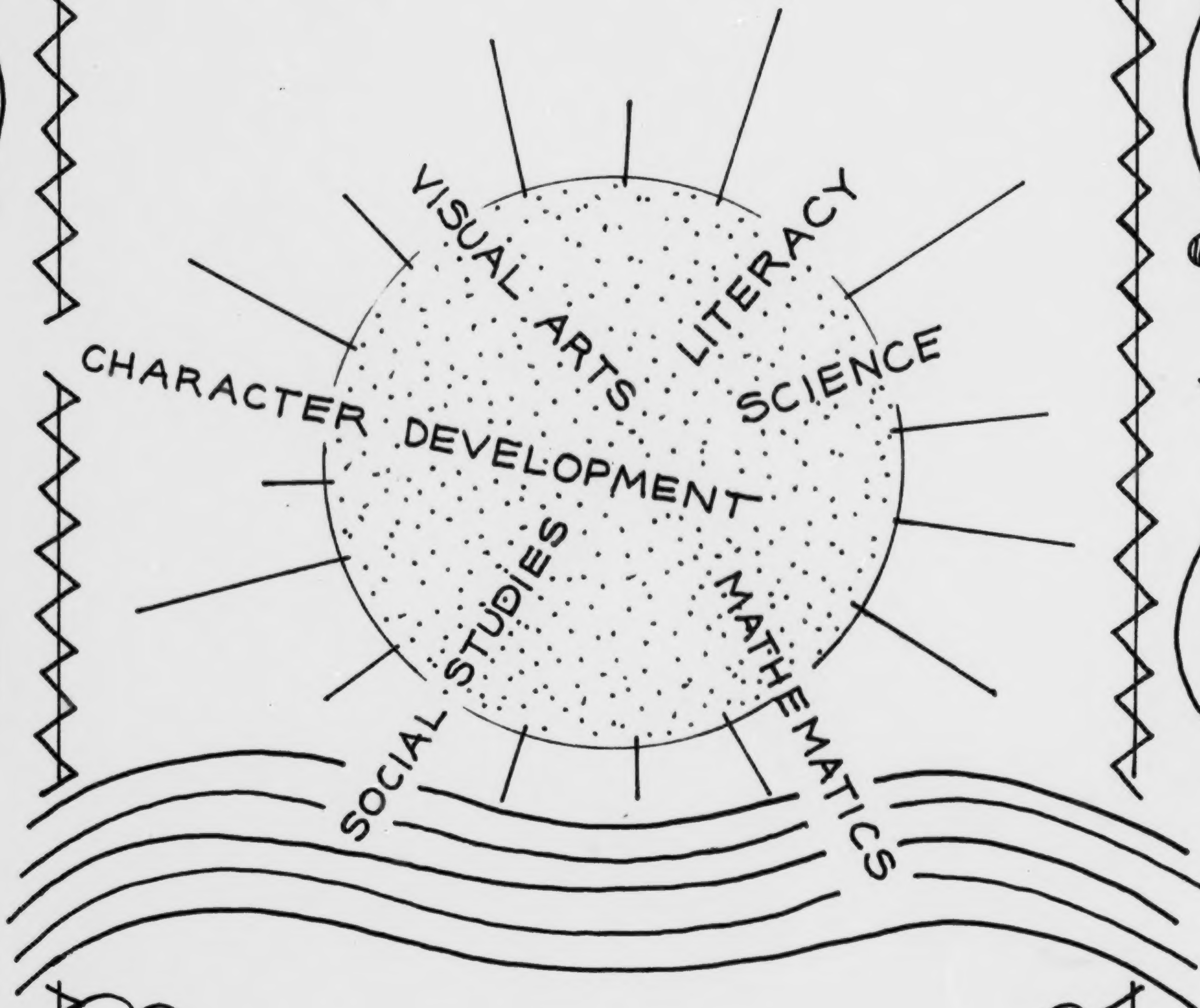
GOALS FOR THE STEP BY STEP PRIMARY PROGRAM


VISUAL ARTS
LITERACY
CHARACTER DEVELOPMENT
SCIENCE
SOCIAL STUDIES
MATHEMATICS

II. GOALS FOR THE STEP BY STEP PRIMARY PROGRAM

Good ideas and innovations must be driven into existence by courageous patience.

Hyman Rickover

Goals for the Step by Step Primary Program respect children's intellectual, social, and developmental needs. Goals are unique for each grade level within a common framework of child development. That is, six- and seven-year olds' goals for learning are established in the following areas: academic, social emotional, and aesthetic. This way of organizing the goals ensures that the whole child is considered as teachers make decisions about curriculum, instruction and assessment. By clearly defining and maintaining high standards for achievement, the Step by Step Primary Program assures quality in all areas of learning and teaching. Specific goals which relate to lessons are cited in Part Two in each content area chapter. The following are general goals which serve as standards in the Step by Step Primary Program.

General Goals for Character Development

In character education children will:

Show respect for others by listening and responding appropriately.

Report in writing or verbally about a real life hero.

Work with others in a cooperative spirit.

Demonstrate self-reliance by being organized .

Participate in fair and honest ways.

General Goals for Literacy

In reading, children in the Step by Step Primary Program will:

Choose reading materials which reflects their interests, and ability level.

Read a variety of genres or kinds of writing, such as fiction, poetry or factual prose.

Recognize the value of reading in their lives.

Make predictions and draw conclusions based on comprehension of story content.

Use new vocabulary.

Respond to literature by creating art, writing, dramatizing, talking, or singing.

Recognize the basic elements of a story, beginning, middle, and end.

Make comparisons between situations in literature and life.

In writing, children will :

Write journal entries, stories, notes, letters, poems, signs, lists, labels, and directions.

Revise written work to the satisfactory level of quality.

Attempt to express their ideas on paper completely.

Spell commonly used words.

Use simple punctuation and capitalization appropriately.

In speaking and listening, children will:

Develop verbal skills and confidence when speaking.

Use appropriate vocabulary.

Rely on language to resolve conflicts and solve problems.

Practice social conventions of speaking, such as taking turns.

Learn to modulate voice tone and volume.

Develop attentive listening skills.

Wait for a response when having a conversation.

General Goals for Mathematics

In mathematics children in the Step by Step Primary Program will:

Demonstrate number sense about numbers, large and small.

Perform addition and subtraction using objects to illustrate the concept.

Estimate probability of outcomes in simple games of chance.

Make predictions based on data collected.

Show results of data collection by using visual displays such as graphs, charts, and writing.

Use measurement to solve problems.

Recognize numerals and corresponding amounts.

Write and solve story problems that include everyday events.

Use creative strategies to solve daily problems and explain the process used.

Count and recognize currency.

General Goals for the Visual Arts

In visual arts, children will:

Be comfortable using a variety of materials such as paint, clay, cloth, and paper to create art.

Use proper vocabulary to describe artwork and materials.

Describe elements observed in art, such as line, shape, color, and texture.

Show care in using materials and responsibility in cleaning up.

Provide many opportunities for creative exploration.

General Goals for Science

In science, children will:

Acquire and apply knowledge to distinguish between the natural and human-made world.

Recognize patterns in the natural world.

Make generalizations about how changes occur in nature.

Perform simple experiential investigations to test an idea.

Apply science process skills: observing, sorting, measuring, thinking, predicting, communicating.

Apply scientific facts and thinking to solve problems.

Ask questions and be diligent in getting answers .

Recognize a variety of ways to reach solutions.

General Goals for Social Studies

In Social Studies, children in the Step by Step Primary Program will:

Retell a story about an historical figure.

Create a personal time line of significant moments in their own lives.

Discuss legends and fables from a variety of cultures.

Construct a model of landforms and bodies of water.

Identify historical and meaningful sites in the community for study and exploration.

Attempt to make a map of the classroom, their home or neighborhood.

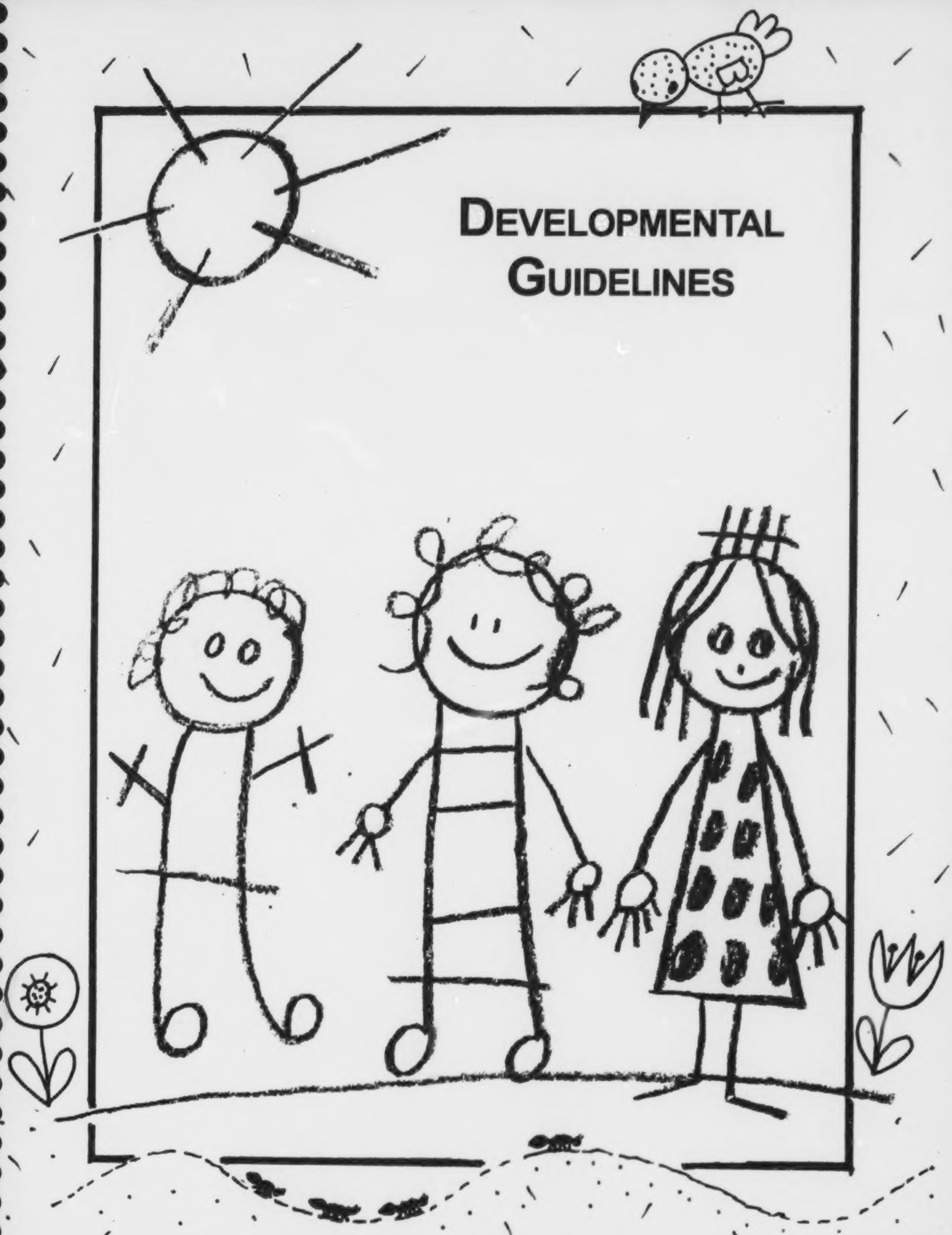
Contribute to establishing classroom rules.

Make group decisions by discussion and voting.

Identify national symbols.

Be able to sing traditional songs.

DEVELOPMENTAL GUIDELINES



III. DEVELOPMENTAL GUIDELINES

The source of curriculum is the child. The knowledge of children informs curriculum and we first seek that knowledge in the direct testimony of the child.

Ruth Charney

The Step by Step Primary Program is committed to making curricular decisions based on what is best for children. In a developmentally designed classroom, the child's interest and needs help to determine what is taught. The content based on child-interest is balanced by the teacher's knowledge of scientific research about child development and normative growth patterns. Teachers must inform themselves about what is characteristic regarding three levels of knowledge:

1. How young children learn
2. How the children learn in the particular age group they are teaching
3. The individual learning style and personality of each child in the class

Teachers adjust and individualize the curriculum based on their understanding of these three levels of knowledge. This is a very challenging task and a key responsibility to becoming a quality teacher. Teachers who work at acquiring this knowledge attest to the fact that the very nature of their teaching changes. It becomes more exciting, intellectually and emotionally satisfying, and enjoyable. Teachers believe that they are better able to relate to children as people. They come to view children as learners in a continuing process of expansion and growth.

In order to create classroom practices and make curricular decisions that match the developmental needs of children, the following characteristics of six- and seven-year olds must be understood. It is important to keep in mind that these are general characteristics that provide an understanding of developmental patterns. They are not standards to be achieved or specific predictions of behavior for a particular age. As educators, we should keep in mind that each child we teach is a unique individual, the product of culture, family, environment, health, temperament, and specific personality. These factors are never static, as subtle changes occur as the child grows. However, there are distinct patterns of development which emerge over time. Within these patterns, there is a wide spread in normal developmental differences. "A two-year span of development is normal in any area of a child's development - physical, social, language, or cognitive growth" (Wood, 1994, p. 6). A six-year old may be reading at a third-grade level and yet display the competitive nature and need to be first of a "typical" six-year old. Some children behave in ways that are older than their chronological age while others, with their cognitive abilities which surpass their social development, may not. Developmental age is the age at which the child functions in social, physical, language and cognitive areas. This differs from the child's chronological age, age in years, by definition. It is common to find differences in developmental ages among children of the same chronological age. As educators who plan the classroom environment and curriculum content, we need to take into account these factors of development in order to help each child reach his or her full potential.

It is appropriate to consider the known developmental difference between boys and girls. Boys and girls both share a common span of development, however, boys tend to be about six months younger, developmentally, than girls at school entrance. A. Soderman (1994) writes,

> *The excellent research in brain growth periodization, which provides further biological support for the work of Piaget and Gesell substantiates the importance of recognizing changing (brain) structures . In the early years boys may be 6-18 months behind girls in moving through these structural changes. Recent research also suggests that at least some of these differences may be due to the differing responses given to boys and girls by teachers based on gender and cultural stereotypes (p.12) .*

The following characteristics of six- and seven-year olds have been adapted from the book *Yardsticks* written by Chip Wood (1994).

The Six-Year Old: Growth Patterns

Physical

- Has good visual pursuit for reading.
- Is more aware of fingers as tools.
- Seems sloppy, in a hurry; speed is a benchmark of six.
- Is noisy in classroom.
- Falls backward out of chairs.
- Learns to distinguish left from right .
- Has oral activity (teething) - chews pencils, fingernails, hair.
- Easily tires; frequent illnesses.
- Enjoys out of doors, gym.

Social

- Wants to be first.
- Is competitive, enthusiastic.
- Sometimes appears to be an ungracious loser or dishonest; invents rules .
- Seems anxious to do well, but does a lot of testing of boundaries.
- Thrives on encouragement; any failure is hard.
- Has tremendous capacity for enjoyment; likes surprises.
- Can be bossy, teasing, critical of others.
- Gets easily upset when hurt.
- Friends are important (may have a best friend).
- School replaces home as most significant environmental influence.

Language

- Likes to work.
- Likes to explain things; show & tell is useful.
- Loves jokes & guessing games.
- Uses boisterous & enthusiastic language.
- Is a complainer.

Cognitive

- Loves to ask questions.
- Likes new games; ideas.
- Loves to color; paint .
- Learns best through discovery.
- Enjoys process more than product.
- Tries more than can accomplish.
- Dramatic play elaborated.
- Cooperative play elaborated.
- Representative symbols more important.
- Understands special relationships and functional relationships better.
- Has a beginning understanding of past when tied closely to present.
- Shows beginning interest in skill and technique for its own sake.

The Six-Year Old in the Classroom

Vision and Fine Motor Ability

- Children should not do much copy work from blackboard; will comply if asked, but it is a difficult task

- Spacing and ability to stay on the line are difficult, inconsistent.

- Eye tracking ability now makes reading instruction manageable.

Gross Motor Ability

- A busy level of noise and activity should be allowed; children often work standing.

- Teachers should encourage a slower pace for children or limit their work to enhance quality.

Cognitive Growth

- Games of all sorts are popular and useful; games, poems, riddles, and songs delight and illuminate; teaching through games produces stronger learning patterns than workbook learning.

- There is an artistic-explosion. Clay, paints, dancing, coloring, book making, weaving, singing are tried out seriously for the first time; children need to feel their attempts are valued, that there is no right and wrong way to approach an art medium; risk-taking now enhances later artistic expression and competence

- There is a high volume of products but low quality of completion. Children are proud of how much they get done, but not concerned with appearance.

- Pay attention to children's delight in the doing (especially for themselves). This includes academics, clean-up or snack; they are ready for experiments with individual or group responsibility.

- Social Studies must be related to the present. Field trips are very popular and productive when followed by representational activities such as experience stories, working block area; children can only begin to understand past events (history) when closely associated with present.

Social Behavior

- Extreme behavior needs to be understood but not excessively tolerated; tantrums, teasing, bossing, complaining, tattling are ways six-year olds try out relationships with authority.

- Children are extremely sensitive. A bit of encouragement may be all a child needs to get over a difficult situation, severe criticism can truly injure.

- The competitive edge should be eliminated from games when used for learning; six-year olds are highly competitive and can overdo the need to win and be first.

The Seven-Year Old: Growth Patterns

Physical

- Is visually myopic.
- Works with head down on desk.
- Uses pincer grasp at pencil point.
- Demonstrates tidy, neat written work.
- Is sometimes tense.
- Likes confined space.
- Feels many hurts, real and imagined.

Social

- Inwardized, withdrawn.
- Is sometimes moody, depressed; sulking or shy.
- Feels like "nobody likes me".
- Has changeable feelings.
- Needs security, structure.
- Relies on teacher for help.
- Doesn't like to make mistakes or risk making them.
- Is sensitive to others feelings, but sometimes "tattles".
- Is conscientious; serious.
- Keeps a neater desk, room.
- Needs constant reinforcement.
- Has strong likes and dislikes.

Language

- Is good listener.
- Talks precisely.
- Likes one-to-one conversation.
- Expands vocabulary rapidly.
- Is interested in meaning of words.
- Likes to send notes and use codes.

Cognitive

- Likes to review learning.
- Needs closure, must complete assignments.
- Likes to work slowly, and often alone.
- Can classify spontaneously.
- Likes to be read to.
- Shows growing reflective ability.
- Erases constantly, wants work perfect.
- Likes to repeat tasks.
- Enjoys manipulatives and board games.
- Wants to discover how things work; likes to take things apart.

The Seven-Year Old in the Classroom

Vision and Fine Motor Ability

- Printing, drawing, number work tend to be small. Children work with head down on desk, often hiding or closing one eye.
- Copying from board can be harmful.
- This is not the time to introduce cursive handwriting.
- Printing and drawing are anchored to bottom line; it is difficult to fill up space.
- Children often work with three fingered grasp at pencil point and find it difficult to relax grip.

Gross Motor Ability

- Teachers should plan for quieter room; sustained, quiet work periods with little overflow behavior.
- Children prefer board games to gym games; playground games become more popular than team or large group activities.

Cognitive

- Special attention should be paid to routine and children's need for closure. They want to finish work they begin and need a warning to prepare for transitions; timed tests can be especially troublesome.
- Children like to work alone or in pairs; memorization is popular, along with codes, puzzles and other secrets.
- Children want work to be perfect, classroom attention to products proper display of work is appropriate.
- Children enjoy repeating tasks and like to frequently seek out the teacher.
- Discovery centers or projects are often successful; children like to collect and sort.

Social Behavior

- There are frequent friendship shifts; children work best in pairs or alone but will; accept teacher seating assignments.
- Schedule changes are upsetting.
- The classroom is moderately serious. Humor and games are appropriate.
- Communication with parents is critical during this changeable time.
- Anxiety about tests, assignments, recess can produce physical complaints.

Teachers of young children must be committed to maintaining a developmental perspective when working with individual children. Seeing each child as an individual, deserving respect and understanding is key to creating successful experiences for each child. Teachers who practice a developmental approach to teaching share common characteristics.

- They encourage and accept student autonomy and initiative. Autonomy and initiative are motivating factors in an individual making connections between ideas and experiences. Children who ask questions and then get busy answering them are taking responsibility for their own learning and becoming problem solvers.

- They provide a variety of materials including manipulatives and collections; resources, as well as experts and out of school trips.

- They follow the child's lead in suggesting areas of interest to be pursued by developing projects, creating thematic units and becoming a learner along with the child. Children's interest and experiences are built on through teachable moments. A teacher can promote new learning by providing resources and information at a particularly significant time of intense interest.

- They start an exploration of a topic by inquiring about student's understanding of the topic before sharing their information about the concept. Questioning to discover what the children know, what they want to know and how they can learn is a strategy of a teacher committed to developmental practice.

- They encourage children to ask questions, engage in discussions and elaborate their responses. They support the children's thinking strategies and show respect by allowing the child adequate time to respond.

These characteristics may help serve as guides to teachers in the Step by Step model who seek information about what it means to teach in a developmentally appropriate way.

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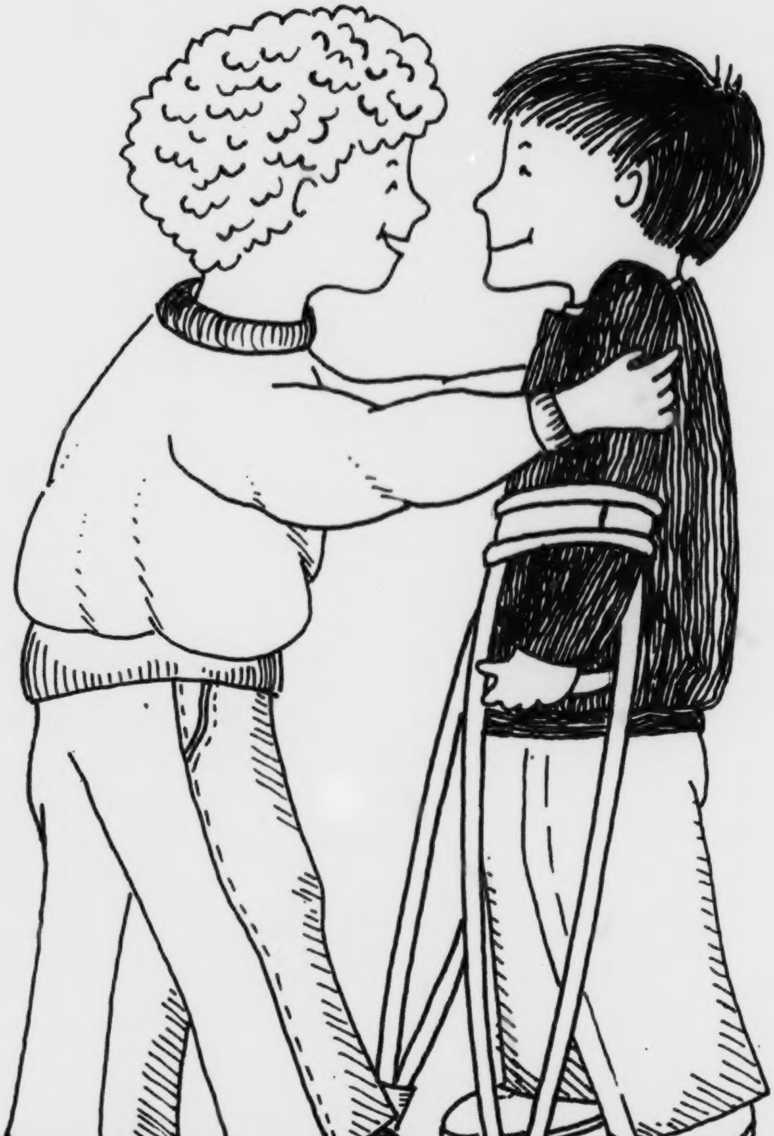
CHARACTER DEVELOPMENT



IV. CHARACTER DEVELOPMENT

To be good is noble, but to teach others how to be good is nobler.

Mark Twain

To educate for character development: what does this mean? It means that, as educators, we must fully accept the fact that we are educating the heart as well as the mind of each child in our care. The goal is to develop the habits of heart and mind of those working together in a school community. These habits are rooted in mutual respect and responsibility. Educating for character development affects how the adults and children treat each other daily. It affects how decisions are made, power is allocated and how resources are shared. It affects how learning and teaching happen. It is the essence of a strong school community.

How can we best do this work of community building? What is involved; what are the components?

In *Freedom and the Moral Community*, Dan Heishman writes about a meeting which took place 75 years ago and has great relevance today.

> *In Heidelberg, Germany, in 1925, the German philosopher Martin Buber made the remark that, "I love freedom, but I do not believe in it." In making this comment to a group of educators Buber was pointing to the tendency we all have to view the opposite of compulsion and restriction as freedom. Instead he reminded those teachers (and all those teaching today) that compulsion's counterpart is not freedom but communion, the deliberate willingness of a group of individuals to take on responsibility and come together as a community. "Independence is a footbridge not a dwelling place," he said. "It is the run before the jump, the tuning of the violin..." Freedom, in essence, is the way to community, not the end in itself (1995, p. 1).*

Our task as teachers is to help children come to understand the unique distinction between the notions "freedom from" and "freedom for." That is, to shift the focus from the idea of freedom from constraints and rules, which is irresponsible freedom, to freedom for civility and respect.

In his book, *Habits of the Heart*, Robert Bellah discusses the current interpretation of freedom, in many societies, as being: left alone, not restricted by expectations or free to opt out of social responsibilities. He insists that this attitude toward freedom will demoralize a society. The result will be abdication of responsibilities by adults and the loss of important models of behavior for children.

It is important for teachers to fully recognize their roles as models of the desired attitudes and behaviors for respect, kindness, and responsibility. The teachers of the Step by Step Primary Program must recognize that they have basic responsibilities to their students. These include an obligation to:

- Respect each child.
- Believe that each child can succeed.
- Be honest, admit mistakes.
- Listen and uphold confidentiality.
- Be consistent and fair.
- Maintain high expectations.
- Value individual effort.
- Appreciate differences and not conformity.
- Create an exciting learning environment.
- Continue to educate themselves about child development.
- Share humor and fun.

It is the duty of teachers to remember that *how* they teach is as important as *what* they teach. In the classroom, children learn moral lessons through how they are treated and how they treat others.

To this end, a Step by Step Primary Program classroom is designed to foster student empowerment and self-determination. We know from numerous research studies that people who have a sense of control over what happens to them have a better sense of well being. Those who feel more control over what happens to them rarely become ill despite high levels of stress. Elementary students had higher self-esteem and a greater feeling of academic competence when their teachers bolstered their sense of self determination in the classroom (Kohn, Phi Delta Kappa, September, 1993). Providing as many opportunities for choice in a classroom is the significant factor in developing self-determination in young children and ensuring sound decision makers of the future. As Constance Kamii (1991) has written,

> *We cannot expect children to accept ready-made values and truths all the way through school, and then suddenly make choices in adulthood. Likewise, we cannot expect them to be manipulated with reward and punishment in school and to have the courage of a Martin Luther King in adulthood (p. 387).*

The environment in which positive values are taught must promote autonomy and independent thinking, not simply obedience. The obvious way in which children can acquire the skills for decision making and a readiness to use them is to give them many opportunities to make decisions during the course of their daily lives. Teachers can do this in any classroom with children of all ages by giving them options for materials, choice about which activity they will begin their day with, where they will sit, how they will approach a task and many other necessary activities of the school day. As adults we know that when we have a choice over the content and methods of tasks we must carry out, we are more motivated and ready to take on the job.

This is the same for children. Motivation as well as academic success both increase when an individual has some control over the learning. Current brain research, behavioral situations, and individual testimony all indicate that a personal investment in a given task is significantly motivating and produces positive results. We know that when teachers expand the realm in which they seek learners' consent they enhance learning. A few examples from research cited by Alfie Kohn in the September 1993 issue of Phi Delta Kappan follow:

- When second graders in Pittsburgh were given some choice about their learning, including the chance to decide which tasks they would work on at any given moment, they tended to complete more learning tasks in less time.

- When preschoolers in Massachusetts were allowed to select the materials they used for making a collage, their work was judged more creative than the work of children who used exactly the same materials but did not get to choose them.

- When second graders spent the year in a math classroom where textbooks and rewards were discarded in favor of an emphasis on intellectual

> autonomy, that is where children working in groups took an active role in figuring out their own solutions to problems and were free to move around the classroom on their own initiative to get the materials they needed, they developed more sophisticated reasoning skills without falling behind on basic conceptual tasks.

In summary, we quote Alfie Kohn who clearly and eloquently states the intrinsic value inherent in providing choice and control for individuals.

> *Finally, it needs to be said that allowing people to make decisions about what happens to them is inherently preferable to controlling them. It is more respectful and consistent with basic values to which most of us claim to subscribe. Apart from the skills that will be useful for students to have in the future, they ought to have a chance to choose in the present. Children, after all are not just adults-in-the-making. They are people whose currents needs and rights and experiences must be taken seriously. Put it this way: students should not only be trained to live in a democracy when they grow up; they should have the chance to live in one today (Kohn, 1993, p. 12).*

Classroom Activities

What can teachers do in the classroom to promote moral development? We cannot overemphasize the significance of the role of teacher as model of moral behavior. A joyful attitude, friendly tone of voice, fairness and kindness from the teacher are subtle ways in which children experience the kind of behavior we want them to adopt. There are other more intentional structures for developing this kind of behavior in the classroom. We will discuss some of these strategies in the following passages.

Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Pp Qq Rr Ss Tt Uu Vv Ww Xx Yy
BE RESPECTFUL
BE RESPONSIBLE
BE HONEST BE KIND

Shared Values

Young children have a strong desire to do what is right. It is the responsibility of the adults to guide them as to what is right. Together teachers and children can define as a class, and ideally as a school community, what characteristics are most valued. The Step by Step Primary Program model respects the parents' primary role in this area and works closely with families to create a community environment which fosters ethical behavior. Our approach emphasizes such traits as respect, responsibility, honesty, and caring. These are only a few positive values which a class might adopt as standards for behavior. The following exercise may be used to help define which character traits are most valued.

At group meeting time, when the entire class is sitting together on the rug area:

- Ask the children to tell a story about a time at school that made them feel very good and very bad inside.
- Use questions to elicit the value which was or was not demonstrated by the examples the children relate.

- Discuss the ideas and values with the children. Allow them to express negative feelings.

- Ask them to tell what it means to be respectful, honest, kind, or responsible. The goal is to get an understanding of how they perceive the particular value based on their experiences, not a specific definition for the word. For example with regard to respect, ask if adults have to respect children, what determines who shows respect for whom, and do friends respect each other? How do they know that someone respects them?

- Ask what it means to defend someone by using words and not fists. Can they tell about a time when that happened at school, at recess or in their neighborhood?

- Ask for examples of how children's feelings get hurt or how their feelings were prevented from getting hurt.

- Write on chart paper the themes, character traits, and values which emerge from these discussions.

- Model good listening skills and use this time to point out that everyone in the class can have a turn to participate and you want to hear each of their opinions and experiences. This is how the group shows respect for each member and you as the teacher show respect for the children. Do not lecture moralistically.

Once these values are discussed and understood by all the children as rules to guide behavior, both at home and in school, then they are posted in the classroom for all to see. They become the standards against which behavior is viewed. For example, if a child hurts another's feelings or hurts someone physically, the teacher asks, "Which of our rules did you break?" "How will you make the situation right?" This approach gives the child the responsibility to correct the problem, does not involve excuses, and helps the child realize that by planning to correct the wrong she is able to "redeem" herself in the eyes of her peers.

Academics

Children develop character and learn ethical behaviors best by following the examples of significant adults in their lives. They also achieve these goals by finding out about the lives of heroic individuals in their country's history, and in current life; by discussing the moral of a story, and by developing sound habits based on defined shared values.

This kind of learning occurs throughout the Step by Step Primary Program. While studying history for example, children discuss acts of heroism. In games and sports, they consider what it means to be a team player and good sport. When reading aloud to children and when teaching them to read, teachers can give special attention to stories with ethical themes. Children come to understand that, despite differences in culture and appearance, people can share common values and principles. They learn that people deserve respect despite differences in appearance. The goal of building individuals of sound character permeates all aspects of the Step by Step Primary Program.

Morning Meeting

Morning Meeting is a teaching approach which helps integrate the academic and social curriculum in a way which helps teachers and students be more responsive to each other. It is an example of universally used, good early childhood practice which was formally structured by Ruth Charney and Marlynn Clayton of the Northeast Foundation. As a daily event recommended for all primary ages, its stated aims are:

1. To create community.
2. To encourage sharing, listening, including and participating.
3. To teach, through daily rituals and patterns, the skills needed to be a responsive member of a classroom and school.

Morning Meetings have a specific structure and should begin when everyone arrives each morning. The success of the meetings over time depend on consistency in including all components of the prescribed format. These daily events provide for children's social and academic needs that are crucial to their success in school. The regularity of these meetings allows for repetition and practice of the traits and behaviors we desire for the children. Just as children's reading, music, and physical skills improve with practice, so do their ethical and responsible behaviors. Morning Meetings:

- Teach children to care about themselves and each other.
- Create an alert, responsive, and friendly tone for the day.
- Establish rituals and routines.
- Provide both individual and group opportunities for participation.
- Recognize that each person's contribution is important.
- Teach important skills for academic success such as listening, speaking, synthesizing information, problem solving, following directions, decision-making, reading, writing, spelling, and math skills.

The Step by Step model is committed to children learning how to be responsible participants in a democratic society. Through parents and schools working together, and classroom teachers, who demonstrate kindness and practice developmental teaching, caring communities are built.

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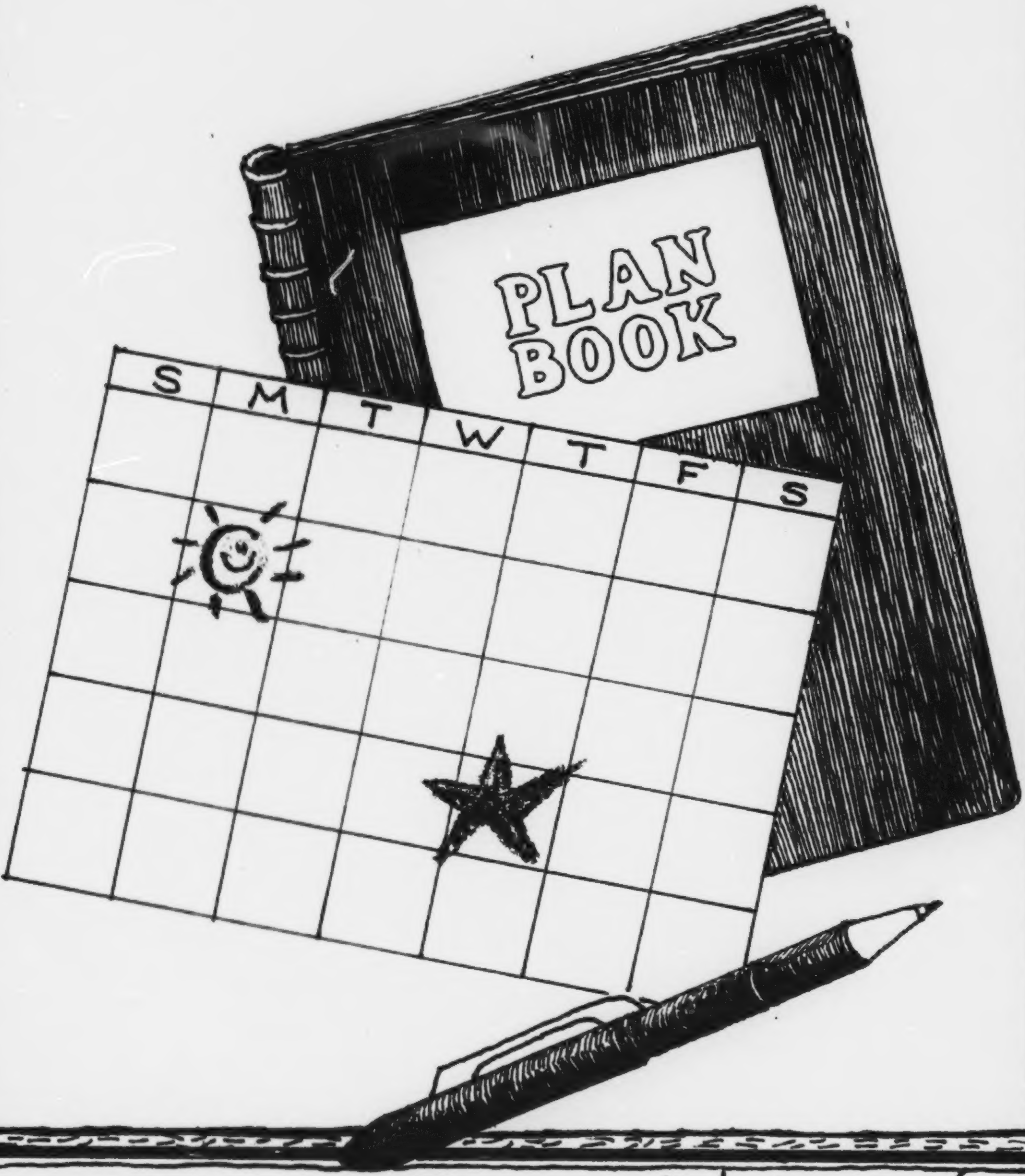
CLASSROOM MANAGEMENT IN THE CHILD-CENTERED CLASSROOM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V. CLASSROOM MANAGEMENT IN THE CHILD-CENTERED CLASSROOM

> *Successful are the teachers who have brought their class to the stage where they can say, "Whether I am present or not, the class carries on. The group has achieved independence."*
>
> Maria Montessori

Overview

It is not only important, but essential, to consider developmental theory when we define the concept of how a primary classroom is managed. Erikson, Piaget, Vygotsky, Gesell, and other developmental theorists have outlined and defined characteristics exhibited and conflicts experienced by six- and seven-year-old children that teachers can apply very practically to material and behavioral management in classrooms.

The purpose of this section is to define and describe management of a classroom that supports a child's developmental needs within a sociocultural context. Effective first grades foster industry, initiative, autonomy, trust, knowledge construction, involvement in rule making, cultivation and maintenance of friendships, collaboration and cooperation, respect of classmates and teachers, responsibility, and success.

Materials and Organization

In the child--centered program, there are certain essential materials that each classroom will need. In addition, there are optional materials that can be gradually introduced throughout the course of the year. The focus of this section will be on the essentials. Organization and introduction of these essential materials will be outlined and described. Optional centers will also be briefly described. In the appendices, diagrams of classrooms and individual learning centers will be provided for clarification.

Learning Centers

The organization of essential materials into centers is both logical and research based. Since children learn by associating new information with known information and novel materials with familiar materials, it is logical to group similar materials together in learning centers. Following this line of logic, it makes sense to cluster these groups in a way that is both functional and appealing to students. In other words, loud centers should be near other loud centers; messy centers should be near a sink or as close to a bathroom as possible; and quiet centers should be near other quiet centers. More specifically, blocks should be near drama; art and science should be near the sink; and the library should be near the writing center and the listening center. No one will be able to enjoy the literacy area if it is next to the block center. In addition, children and teachers should have a clear view of each other and should be able to navigate the room with ease. It would be difficult for people who are working in the blocks to enjoy themselves if people who are working in art drip paint on them and trip over their structures as they walk through the block center to get to the sink.

See Appendix 1 for some sample sketches of first grade classroom designs.

Essential centers for a first grade classroom would include: a literacy center, writing, science, math/manipulatives, art, and blocks. These centers should be arranged in the aforementioned logical fashion (loud near loud, etc.) and should include the listed, necessary materials.

See Appendix 2 for sample sketches of essential individual learning centers:

Literacy Center

Books
Maps and a globe - (these can be moved to other centers as necessary)
Posters
Poems printed on large charts

Writing Center

Writing implements (crayons, markers, pencils)
Paper
Glue and/or tape
Hole punches and string
A table

Science Center

Rocks, shells, and/or other natural manipulatives
Magnets
Magnifying glasses
Balance scale(s)
Science reference books and magazines
Plants

Art Center

Paint and brushes
Clay
Old magazines
Paper
Writing/drawing implements
A table and an easel

Math/Manipulatives

Counters (plastic teddy bears, unifix cubes, inch cubes, color tiles, and/or other uniformly sized, commercial or homemade manipulatives);
Puzzles
Dice
Dominoes
Rulers, a balance scale, and/or other materials for gauging measurement
Games (homemade or commercially produced)

Blocks

Three dimensional wooden blocks of standard size (a unit is the standard - other blocks are either one fourth, one half, twice, or four times the size of the unit) and assorted shapes (rectangles, squares, cylinders, triangles)
Toy animals, people and vehicles

The teacher should introduce each of the centers in a gradual and methodical fashion. A desirable introduction schedule would be one or two per day during the first week of school. (See Sample Lesson Plans at the end of this chapter for step-by-step lessons on "Using the Writing Center" and "Using the Block Center").

To introduce a center, gather the children together in the center and demonstrate the use of the materials. When interacting with the children, write their comments about using the center on chart paper. After they have finished their discussion, post the chart paper on the wall beside or above the center for easy reference.

After the children reach a comfort level with using the centers as they are described above, the teacher has two choices. Either begin to add more materials to the existing centers or begin to introduce new centers (one at a time - always gradually and methodically).

If the teacher chooses to add more materials to the existing centers (Option 1), there are many materials from which to choose. Examples of additional or optional materials for the aforementioned centers include, but are not limited to:

See Appendix 3 for sample sketches of optional materials for essential centers.

Reading Center

Specific unit related material (books, tapes, pictures, poems on charts)
Books and tapes
Rulers or pointers for pointing to words in books and on charts
Cushions, pillows, or child sized furniture
Homemade or commercially produced reading games

Writing Center

Specific unit-related material
(If the class has chosen to study "shelters," it would be appropriate to make house, cave, and other "shelter" shaped books for the children to use for writing. Note: children should feel free to write anything in these books. Some children will choose to write about the people, bears, etc. who would live in the shelter - others will not. The important thing to remember is that it is their choice.)
Additional writing implements (chalk, paint and brushes, pens, etc.)
Old magazines
Staplers and staples
Dictionaries, word cards
(These can certainly be used for purposes other than writing.)

Science Center

Specific unit-related material
  (If the class has chosen to study the "African grasslands", it would be appropriate to add pictures of African grassland animals, books about the grasslands, and seeds of the grasslands for the children to explore and manipulate.)
An animal
  (Small pet such as a guinea pig or fish - children can document its growth and care for it.)
A microscope

Art Center

Specific unit-related material
  (If the class has chosen to study the "oceans of the world", add magazines with ocean pictures, sand, shells, salt, and other items that could be found near or in the ocean for the children to use to create art.)
Material scraps
Sponges, wire brushes, and squirt bottles for painting
Reproductions of famous paintings

Blocks

Specific unit-related material
  (If the class has chosen to study "shelters," add plastic people and animals and assorted homemade, child created, and commercially produced "shelters" for the children to use as they build.)
Hollow building blocks
Legos and other commercially produced building materials

If the teacher chooses to introduce new centers (Option 2), consider the following:

See Appendix 4a and 4b for a classroom design integrating optional centers [4a] and sample sketches of individual optional centers [4b].)

Drama Center

The drama center could simply be a "prop box" that changes with each unit of study or each shared reading selection. For example, if the unit of study is "shelters," the class would read something like *The Three Little Pigs* during shared reading time each day for one week. Introduce a prop box containing masks of the three pigs and the wolf, some straw, and some sticks; suggest that the children use the props in the block center. The children could build the set and reenact the story.

Junk Construction

The junk construction center could supplement the art center and/or the block center. The teacher and the children can bring in empty boxes and cartons, plastic jugs, metal or plastic bottle tops, and other safe disposable materials (no glass containers or containers that have held poisonous substances). The children can use the disposable items to make sculptures.

Listening Center

The listening center can (and should) be near the literacy center. It should contain a tape recorder/player, music and story tapes, and books. It can also contain musical instruments and headphones.

Discovery Center

The discovery center should be near the science and/or the art center and will be another center— like the drama center— that will be specifically unit-related. For example, if the class is studying the "oceans of the world," the teacher might set up a discovery table on which children can taste foods from the sea (both animals and plants - shrimp, squid, seaweed, etc.) and construct a graph of their favorites. This activity would be available for one week. The next week, the teacher might have sand of a variety of textures and colors that the children could manipulate and arrange from darkest to lightest and/or smoothest/finest to roughest/coarsest. The children could glue the sand on paper and write describing words under each category. The teacher could show the children where the different types of sand might be found on a map or globe.

Concepts

Children need to be taught how to manage the materials in the classroom. When planning a child- or learner-centered environment, it is important for a teacher to demonstrate for the children how the materials are to be used. Teachers should assume that children may not be familiar with the materials found in the classroom.

For example, a young child entering the program may not know how to safely and appropriately handle a pair of scissors. The teacher has two choices. The first is to assume that many children will be familiar with scissors and that those who are not will see their peers using scissors appropriately and will model their behavior. The flaw in this logic is that children do not always look at their peers as role models. Often, what will happen instead is that some children will mishandle the scissors. In this scenario, the children who are unfamiliar with scissors are not prepared to succeed and may fail. The second is to assume that some children will be unfamiliar with scissors and that all children will need to review safe scissor handling. The teacher quickly demonstrates how to handle scissors appropriately, asks two children to show their peers how to handle the scissors, and assures children that while they are working, she will help them if they need it. In this scenario, children are set up for success.

The teacher should introduce all classroom materials - pencils, crayons, paints, blocks, manipulatives, books, etc. - gradually and methodically in a manner similar to the second scissor handling example above. As materials are introduced and the use of each is demonstrated by the teacher and two or three students, the group can discuss where and how the object(s) should be stored.

For example, if a class has just completed a discussion on the use of glue, they might benefit from further discussion on where to store glue. Perhaps many children and the teacher may think that glue is best utilized - and therefore stored - in an art center. However, there may be a few children who will disagree and assert that glue belongs in a writing center. Both groups are correct. The class can now decide if they would like the glue to be stored in the art center, the writing center, or both. By creating and participating in this discussion, the members of the class (including the teacher) have been involved in a meaningful conversation in which they have felt free to express their opinions.

To ensure further success of handling classroom materials on a daily basis, items should be clearly labeled with a picture (drawing or photograph) and the name of the item(s). Teachers should put labels both on a shelf and on the box in which the item is stored.

Materials should be organized and stored in "learning or interest centers". Children and teachers can decide together which centers they would like to include in their classroom. Some common centers are writing, art, science, math, blocks, and reading. A teacher can set up these six centers and present the class with a challenge to create two or three more centers. The teacher could suggest some centers such as: discovery, listening, drama, or "junk construction" (a center in which children use throw away items like cereal boxes to make sculptures, etc.) and could also elicit suggestions from children. The group could discuss and vote on the options. Finally, the teacher would organize the necessary materials and introduce the centers - one at a time - gradually.

Children who are actively involved in the organization and choice of materials and who receive careful instructions about using them appropriately are prepared to use them independently and responsibly. However, when children choose not to use the materials or centers responsibly, it becomes necessary for the teacher to step in and remove the item(s) or close a center. When this happens, the teacher should explain why she is taking the action and should assure the children that she will return the item(s) to the center or reopen it in the near future. Removing a misused item or closing a disheveled center is a logical consequence of inappropriate use of materials. These actions make sense to children and seem fair to the "rule conscious" young child. Children need to be reminded with actions as well as words that responsibility comes with independence.

Children need to be shown how to manage their behavior. They need many opportunities to make choices within the structure of their day. The child-centered classroom is different from the traditional classroom in many ways. One crucial difference is in the way behavior is managed. In the traditional classroom, the teacher made the rules and the students followed them. If students broke the rules, they were punished. Children were neither encouraged to develop self-control nor allowed to make choices in these classrooms. In the child-centered classroom, students develop self-control and make choices, moreover they help generate classroom rules and make decisions about how they will use their time during the day.

Making Rules

To involve children in the creation of rules, a teacher should gather them in a circle in their class meeting area and open a discussion about the purpose of rules. It is important that children begin to understand that rules - like laws - are designed to keep people safe, to protect individual rights and freedom, and to provide guidelines for appropriate behavior. Children need to know that rules should tell members of their class what they should do rather than what they should not do. During the discussion, the teacher can offer some examples of positive, concise rules such as: Walk in the hallways; Put things back where they belong; Use words to solve problems; Listen when someone else is talking; as well as elicit ideas from the children. The class can decide which rules they will adopt. The teacher should remind the students that they should choose a few concrete rules rather than many very detailed ones. The selected rules should be printed on a chart and posted in the class meeting area for easy reference.

After the rules for the class have been created and posted, the teacher should notice when children follow the rules and make specific comments to encourage other children to model appropriate behavior. For example, if the class has adopted the rule, "Listen when someone else is talking", and the teacher can tell that a particular child is really listening to someone else, the teacher could comment, "John, I noticed that you were really paying attention to Susan when she shared her story. When you said, 'Susan, I like the words you used to describe the old house,' you let Susan know that you listened to what she had to say." Or if the class has adopted the rule, "Return things to their place", and the teacher notices that a child is doing an exceptional job of cleaning up, the teacher might say, "Mary, I noticed that you cleaned up all of the crayons that you were using and then helped Matt clean up his crayons."

When children choose to break a rule, the teacher will need to remind them of the rule and encourage them to redirect their behavior. For example, if the class has adopted the rule, "Listen when someone else is talking", and two children decide to hold a conversation while the teacher is talking, the teacher might say, "It is my turn to talk and your turn to listen." If the two children continue to talk, the teacher should ask them to leave the group. The teacher should state in a firm, but not harsh, tone, "You may return to the group when you are ready to listen."

Children need to know that adults will help them learn to manage their own behavior. They will need support, encouragement, reminding, and redirecting to begin to do this.

Time Management and Planning

When children are comfortable applying the classroom rules, they can begin to plan how they will use their time within the structure of the daily schedule.

At the beginning of the school year, as the teacher is beginning to introduce children to the materials and demonstrate the use of the materials, she can offer children choices during specific times during the day. In the child-centered classroom, it is essential for children to learn to make decisions. One effective way to encourage them to do this is to offer appealing options throughout the school day.

For example, at the beginning of the year, the teacher may organize the day as follows:

FIRST HALF OF YEAR ACTIVITIES

ACTIVITY	OPTIONS
Manipulatives	•Inch cubes •Dominoes
Morning Meeting	
Writing Workshop	•Journals or small books •Crayons or pencils
Snack/Outside Play	
Shared Reading (the teacher and children read a book together and the children respond to the book in one of two ways)	Responses: •Paint a picture. •Make one of the characters from the book out of clay for a class diorama.
Reading Workshop (independent reading)	•Read the text of a book. •Read the pictures of a book.
Lunch/Outside Play	
Story Time and/or Large Group Game	
Math Meeting (The teacher demonstrates how to play two games. Two or three children participate in the demonstration.)	
Math Games	•Checkers •Domino Matching
Social Studies [topic: Shelters] (Children make houses or buildings from boxes or cartons for a city)	•Use a box or a carton •Make a building or a house.
Clean-up and Prepare for Dismissal	
Dismissal	

During this structured day, students are presented with opportunities to make choices which create an atmosphere in which children can feel safe, yet in control. Choices are appealing and comfortable for the children. As the year progresses, the teacher can include more options and can begin to ask children to plan their time within the structure of the day.

For example, early in the morning each child could complete a sheet like this:

Today, I would like to:

______________________________ during Writing Workshop.

______________________________ during Reading Workshop.

______________________________ during Math.

______________________________ during Social Studies.

As the day progresses, the child can check the plan sheet to make sure that set goals are being accomplished. The child can also modify the plan throughout the day.

By the end of the year, the child should be comfortable making daily plans/goals within the structure of a day similar to the following:

SECOND HALF OF YEAR ACTIVITIES

ACTIVITY	**OPTIONS**
Planning Free Choice/Centers	•Blocks •Art/junk construction •Manipulatives •Reading •Writing
Morning Meeting	
Writing Workshop	•Journals •Book making (using a stapler, glue, wallpaper pieces, etc.) •Large, lined paper •Paint, markers, crayons, and pencils
Snack	
Shared Reading	
Guided Reading and Reading Centers (Small groups work in centers while the teacher works with guided reading groups. Children respond to what they read in the guided reading lesson.)	•Listening •Poetry •Big books and charts •Reading journals •Games
Lunch/Outside Play	
Reading Workshop	•Read the text of a book. •Read the pictures of a book.
Math Meeting (The teacher demonstrates a new game with child partners).	
Math Games	•Play the new game ("have to"). •Play a previously learned game. •Work with manipulatives. •Write in a math journal .
Social Studies [topic: Rainforests]	•Help paint a mural of the Amazon Rainforest - label people, animals, plants. •Write a letter to congress, the President, or an environmental organization to oppose deforestation.
Clean-up, Prepare for Dismissal, and Story Time	
Dismissal	

Although the day is structured, the children have many opportunities to make choices within the structure. They can make plans early in the morning and continue to refer to and modify their plans throughout the course of the day. The above schedule would be appropriate for the second half of the year when children are comfortable with all of the materials, accustomed to making decisions and plans, and more skilled in reading and writing.

Homework

A teacher should assign homework for children ages six and seven for the purpose of practice and review of concepts that have been taught in class. Homework should be an opportunity to apply new knowledge. It should never involve new ideas or concepts that have not been introduced by the teacher in school. Homework for young children in the primary years of schooling should be pleasurable. It must allow them to feel a sense of competency and accomplishment. Homework in the Step by Step Program is designed to promote independence in children. Teachers need to give clear instructions which can be done by the children on their own. Parents are involved in the homework process when the children invite their parents to play math games, read aloud to them, and listen as the children read their own writing. This kind of homework involves parents and children in ways which promote enjoyment, application of concepts, and independence. It is consistent with the Step by Step philosophy.

Fifteen to thirty minutes a night is a reasonable amount of time for six- and seven-year olds to spend on homework. If math games extend beyond the recommended time because they are pleasurable and the child is immersed in the game, then that is acceptable. The idea is for children to feel some level of control in determining their involvement in the homework.

Two specific techniques are used for homework in math and literacy. They are described in the following passages. Teachers should present these techniques to parents early in the school year. They should show them materials and demonstrate how the parents can participate with the child in the homework process.

A "math backpack" is sent home with each child in the class. These backpacks can be made by a parents' group with the school name on them. They contain a math game which applies a particular mathematical concept in game form. The teacher presents the particular concept, for example the addition and subtraction facts for the number seven.

A board game is created to illustrate these facts which is put in the backpack and is sent home. Ideally, there should be from 4-6 backpacks available per classroom. It should be mentioned that this is not the only way of assigning math homework but allows for variety and fun in homework assignments. We know that children learn a great deal through play. The math backpack homework method applies this knowledge of child development.

A somewhat similar technique is used to promote literacy. A stuffed animal can be "adopted" by the class. This play animal becomes the "class pet" who takes part in "adventures" such as class activities and field trips. These adventures are written down in a journal which is kept by the teacher and the class together. The children dictate to the teacher the specifics of a particular activity and what might be the point of view of the class pet. Children take turns giving their accounts and opinions; all of which is chronicled in the class journal. Each child has the opportunity to take the stuffed animal home for a night.

When the toy animal is at a student's home, the parents and child together can write about what happens during the evening. Including the "special pet" in whatever the child does, and writing about even simple, ordinary activities, gives a new focus to reading and writing exercises. The year progresses and the class pet has many trips to homes which are documented in the journal. This provides a great resource for practice reading and a source of pride and personal experiences for each member of the class.

In summary, the approach to homework assignments in the Step by Step Primary Program is one that maintains a developmental and child-centered focus.

Summary

In the child-centered classroom, it would be easy for both the teacher and the students to be overwhelmed by options that are available to them. That is why it is crucial for teachers to provide structure and at the same time offer choices to the children. The classroom should be logically organized (in learning centers) and the materials should be gradually and methodically introduced. Children should be taught to use the materials appropriately to ensure success. The teacher should guide the children as they learn to effectively manage their own behavior and should include them in making rules for the classroom. Time should be organized so that students are allowed to talk, explore, and move about, more than they are expected to listen to the teacher. Quiet, listening activities should be followed by interactive, moving, or talking activities. Although teachers will do a considerable amount of planning, they should encourage children to plan their time, too.

Children who are educated in this environment will become effective problem solvers and decision makers.

Sample Lesson Plan: Using the Writing Center

Objective

Each child should begin to manage the writing center materials appropriately.

Materials

- Organized and clearly labeled shelves
- Paper of assorted colors, shapes, and sizes
- Writing implements (crayons, markers, paints and brushes, pencils, pens, chalk, etc.)
- Binding materials (glue, hole punches and string, staplers, tape, paper clips, etc.)
- Pencil sharpener
- Chart paper

Procedure

1. Divide the class into half groups if possible. One adult can read a story to one half of the class or demonstrate the use of another center while the other adult teaches this lesson.

2. The children gather in a semi-circle on the floor in front of the writing center shelves.

3. Begin the lesson by saying, "Today, we are going to talk about the different ways you can use the writing center. How many of you had a writing center in your classroom last year?" (Some children will raise their hands or state that they did).

4. Ask how they used the writing center last year? The children will describe ways they used the writing center. Solicit ways that someone who has never worked in a writing center might suggest.

5. Write their responses on chart paper.

6. Ask children to demonstrate appropriate ways to use the writing center (two or three demonstrations are sufficient).

7. Allow the children to apply what they have discussed for a few minutes.

8. Comment on different appropriate ways to manage materials.

9. Guide the children through a clean-up time after a fifteen to twenty minute "free exploration" period.

10. Discuss the experience and answer questions.

Assessment

If the children are able to apply what they have learned on a consistent basis, they are ready for the introduction of new materials. If they have difficulty, the teacher will either need to reteach the same lesson and/or spend time in the writing center modeling appropriate use of materials.

Additional Activities

This lesson can (and should) be extended to include demonstrations of:

- Making books.
- Using collage materials and paint to illustrate child made books.
- Using other centers in the classroom.

Sample Lesson Plan: Using the Block Center

Objective

Each child should begin to manage the block center materials appropriately.

Materials

- Organized and clearly labeled shelves
- Unit blocks
- Plastic or rubber people and animals
- Plastic or metal vehicles
- Pictures (drawings or photographs) of buildings
- Chart paper and a marker

Procedure

1. Divide the class into half groups if possible. If a parent volunteer is in the classroom, one adult can read a story to one half of the class or demonstrate the use of another center while the teacher teaches this lesson.)

2. Gather in a semi-circle on the floor in front of the block center shelves.

3. Begin the lesson by indicating that you are going to talk about the different ways to use the block center and ask how many of them had a block center in their classroom last year? (Some children will raise their hands or state that they did).

4. Ask them how they used the block center in their classroom last year? (The children will describe ways they used the block center before. If they are not familiar with the block corner, ask how they would like to use it.

5. Write their responses on chart paper.

6. Point out the mathematical attributes of the blocks by asking something like, "What do you notice that is special about the blocks?"

7. Encourage the children to note the sizes and shapes of the blocks by stacking two unit blocks on a double unit or two half units on a unit, etc. Perhaps a child might say, "Two of the square ones are the same size as a one of the rectangles!", or, "Two of the little ones are the same size as the big one!"

8. Continue to show the children how all of the blocks are designed to be one fourth, one half, twice, or four times as big as the unit - even the triangles!

9. Ask children to demonstrate appropriate ways to use the block center.

10. Allow the children to apply what they have discussed for a few minutes.

11. Comment on different appropriate ways of handling blocks safely and effectively.

12. Guide the children through a clean-up time after a fifteen to twenty-minute "free exploration" period.

13. Discuss the experience and answer questions.

Assessment

If the children are able to apply what they have learned on a consistent basis, they are ready for the introduction of new materials. If they have difficulty, the teacher will either need to reteach the same lesson and/or spend time in the block center modeling appropriate use of materials.

Additional Activities

This lesson can (and should) be extended to include demonstrations of:

- Using prop boxes.
- Introducing new materials into the block center.
- Using blocks for non-building purposes (such as measuring).
- Using other centers in the classroom.

Sample Lesson Plan: Active Listening

Objectives

In the child-centered classroom, children need to learn to listen attentively to the contributions of other children and the teacher. In addition, they should begin to comment about and question the opinions and products shared by their peers and teachers in a way that is helpful and non-threatening.

Materials

A piece that a child has written.

Procedure

1. Ask one child to volunteer to share something she or he has written during writing workshop.
2. Indicate before the child begins to share that it is important for the audience to listen carefully and to make comments or ask questions that either are specific compliments ("I like the way you used chalk and watercolors to make your illustrations", rather than, "Your picture is pretty", or, "I like your story.") or that will help the author become a better writer ("I got confused when the dog just disappeared. What happened?", rather than, "That was boring", or, "I didn't like your story.") after the child has finished sharing.
3. Model active listening many times. (The active listening process is described in detail in Chapter VII.)
4. Observe and comment about appropriate listening behavior exhibited by the children.

Assessment

The teacher can record comments made by children throughout the course of the year in an anecdotal record book. Periodically, the teacher can compare and assess the length and specificity of comments and questions offered by children to determine growth.

Additional Activities

- Encourage children to use active listening in other large group gatherings such as Morning Meeting or story time.
- Encourage children to use active listening in less structured settings. Teach them to restate what they have heard someone say for clarification.

Sample Lesson Plan: Using Words to Solve Problems

Objective

Each child will begin to use words to solve interpersonal problems with peers and teachers.

Materials

not applicable

Procedure

1. Observe children as they interact with each other and how they handle conflicts.

2. Intervene if they have difficulty expressing frustration, anger, sadness, etc. with words.

3. Seek the "teachable moment" and model appropriate problem solving: For example, if two children are involved in an argument over a balance scale they need to use to complete a math assignment, they may reach a frustration point and begin to tug the balance scale between them. At this point, the teacher would need to step in, get down at a child's level and ask, "What seems to be the problem?" The children would likely say something like, "I need the scale and he won't let me have it!", or "I had the scale first and she's trying to take it away from me!" The teacher will then need to say something like, "Is there a way that you can both use the scale?" The three people - the teacher and the two children - will discuss their options. Perhaps one child will say, "He can give it to me." The teacher should remind the children that there are not enough scales for each child to have one of his or her own. Then, the teacher should indicate, "We will have to think of another solution to this problem. Do you have other ideas?" Perhaps the other child will offer, "We could share it." If neither child thinks of sharing or working together, the teacher can offer this as a

solution and ask the children what they think. The most important part of working together to solve problems is that each person involved in the conflict must feel satisfied with the solution. Therefore, the teacher will need to watch the children as they work together and offer encouragement and support when they need it.

Assessment

The teacher should continue to observe the children as they interact and note in an anecdotal record book if and when they are able to use their newly acquired negotiation skills.

Additional Activities

Verbal problem solving can (and should) be applied in any of the following circumstances:

- Social (playground scuffles, name calling, etc.)
- Academic (material management, derogatory comments, etc.)
- Physical (children who hurt other children must be told in words why it is not acceptable to hurt other people)

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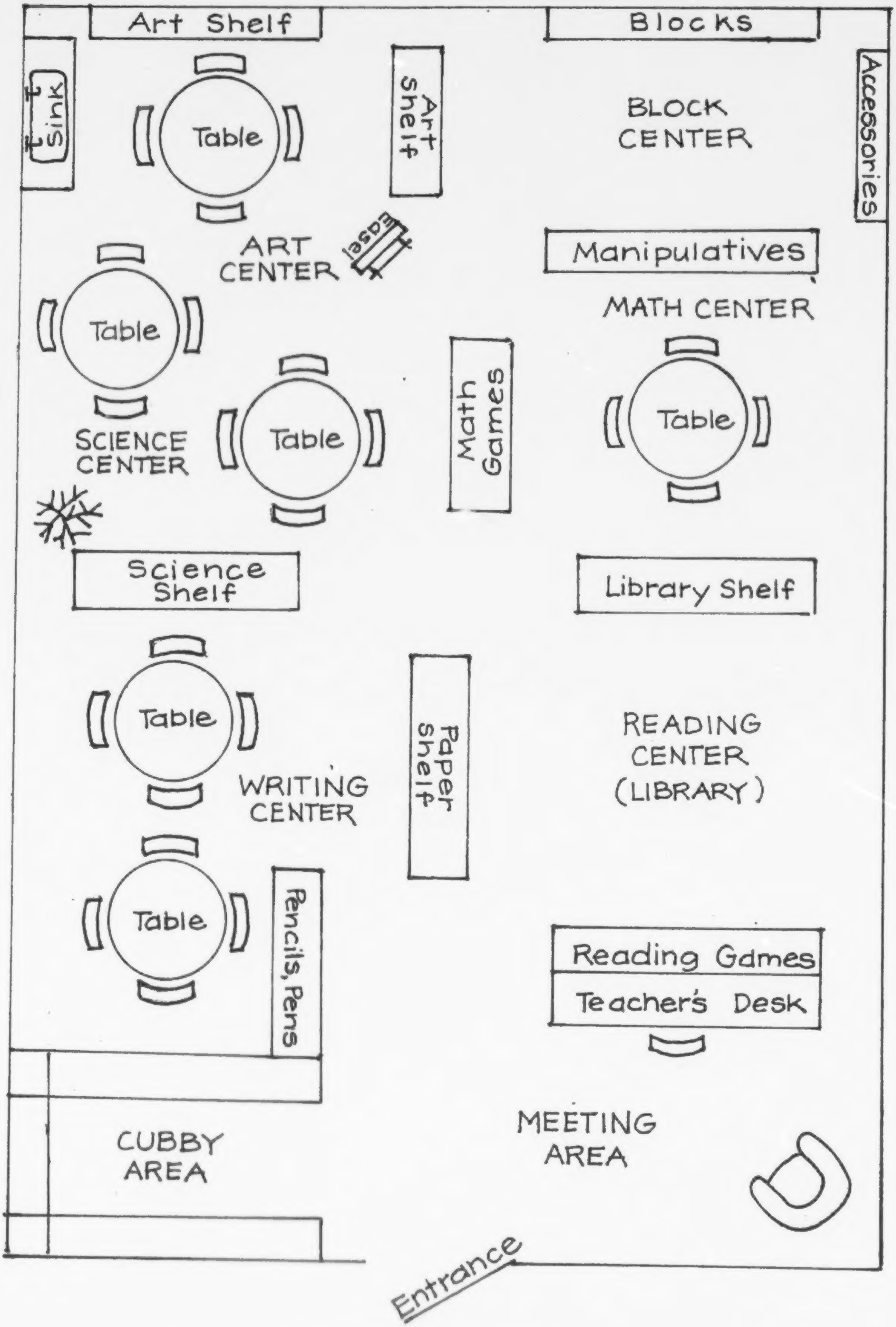
Appendix 1

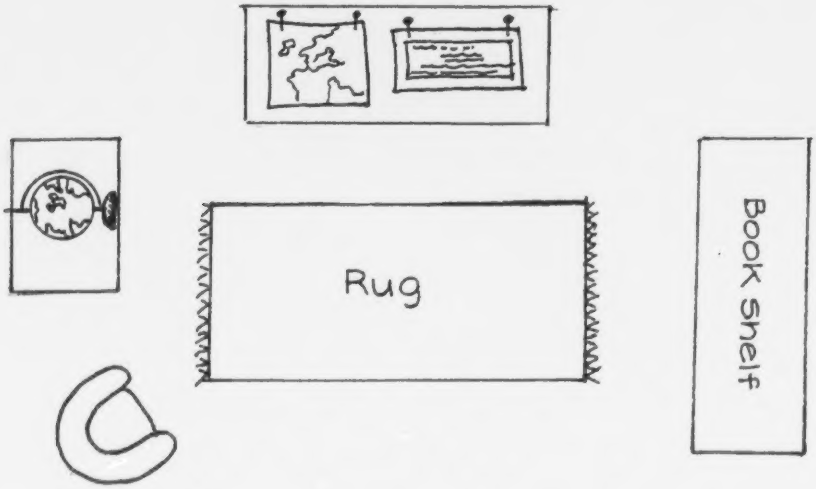


Art Shelf
Blocks
Sink
Table
Art shelf
BLOCK CENTER
Accessories
Easel
ART CENTER
Manipulatives
MATH CENTER
Table
SCIENCE CENTER
Table
Math Games
Table
Science Shelf
Library Shelf
Table
Paper shelf
READING CENTER (LIBRARY)
WRITING CENTER
Table
Pencils, Pens
Reading Games
Teacher's Desk
CUBBY AREA
MEETING AREA
Entrance

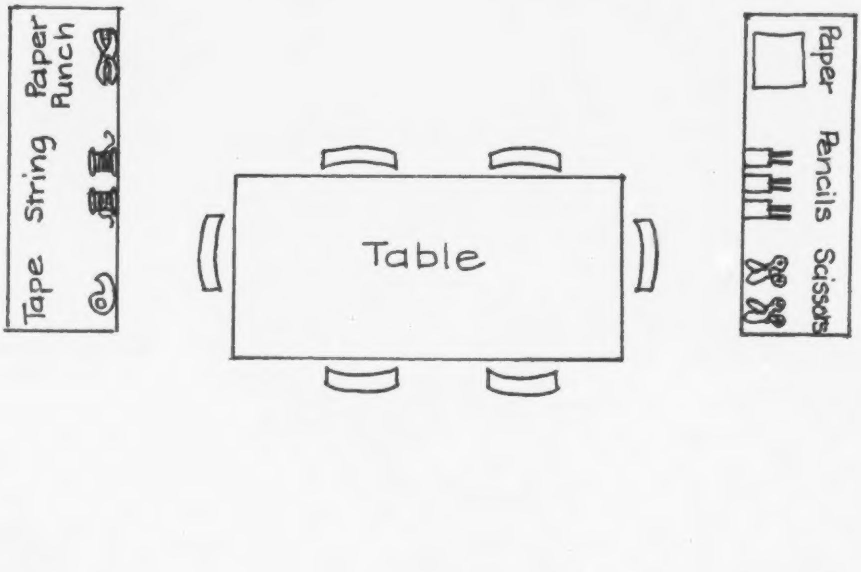
Appendix 2

74

LIBRARY/READING CENTER


Rug
Book Shelf

WRITING CENTER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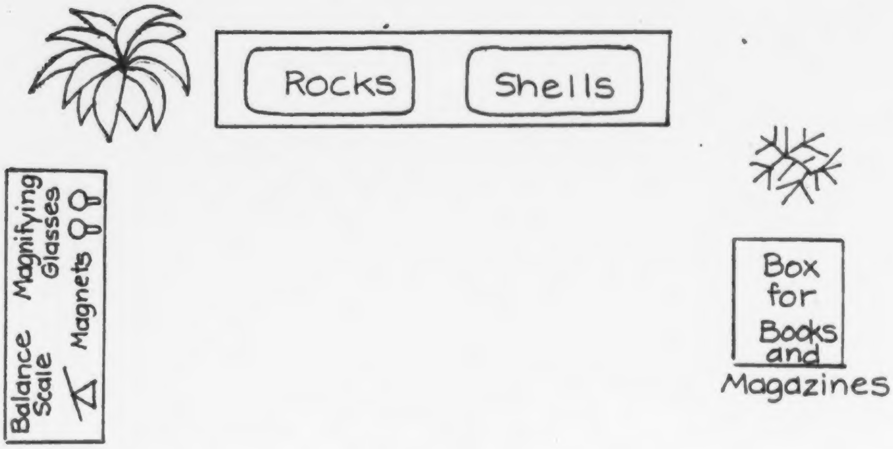
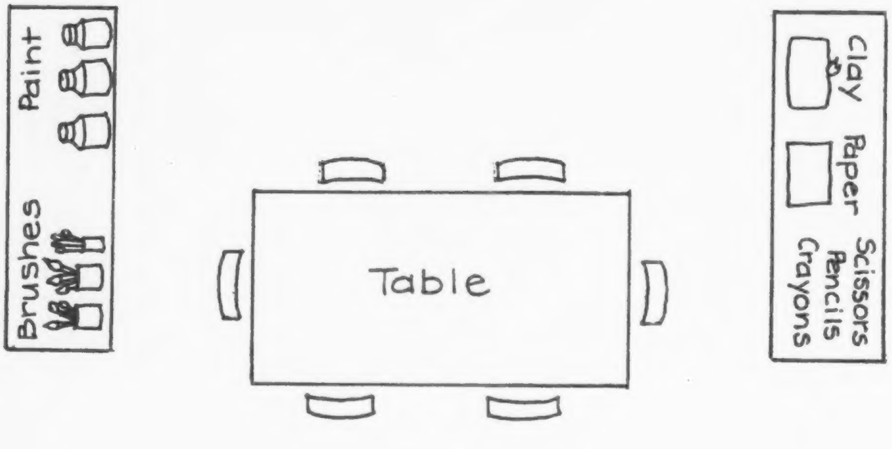
String
Tape
Table
Paper
Pencils
Scissors

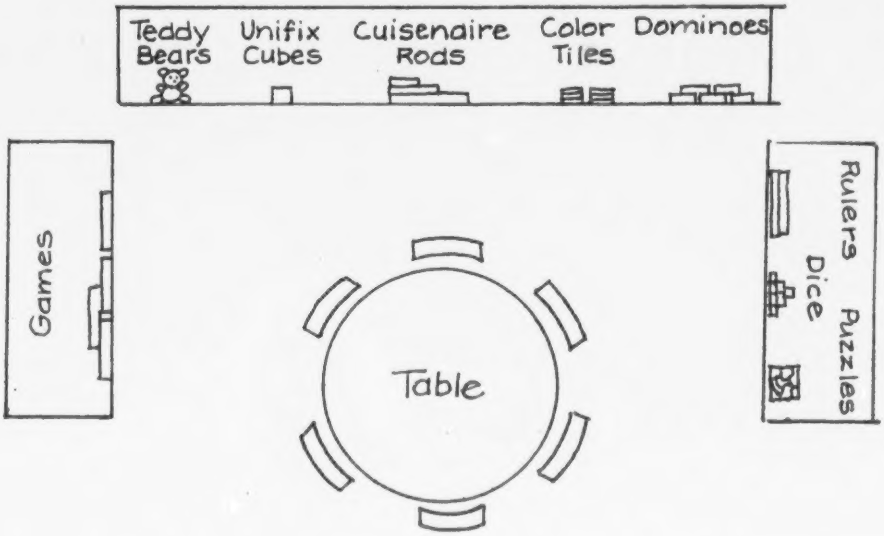
SCIENCE CENTER


Rocks
Shells
Magnifying Glasses
Magnets
Balance Scale
Box for Books and Magazines

ART CENTER


Paint
Brushes
Table
Clay
Paper
Scissors
Pencils
Crayons

MATH/MANIPULATIVES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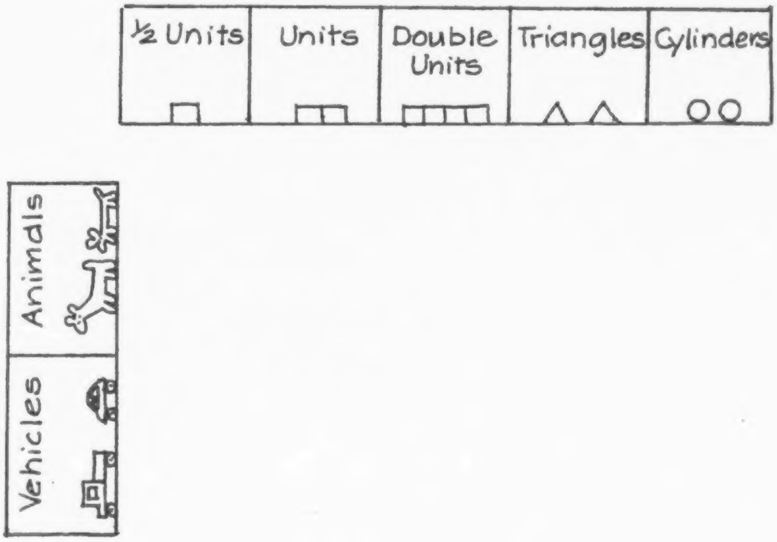
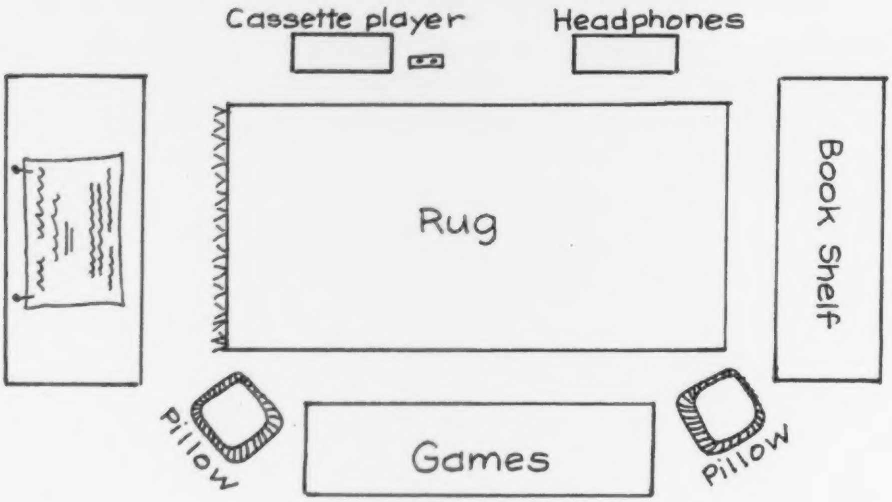
Unifix Cubes
Cuisenaire Rods
Color Tiles
Dominoes
Games
Table
Rulers
Dice
Puzzles

BLOCKS

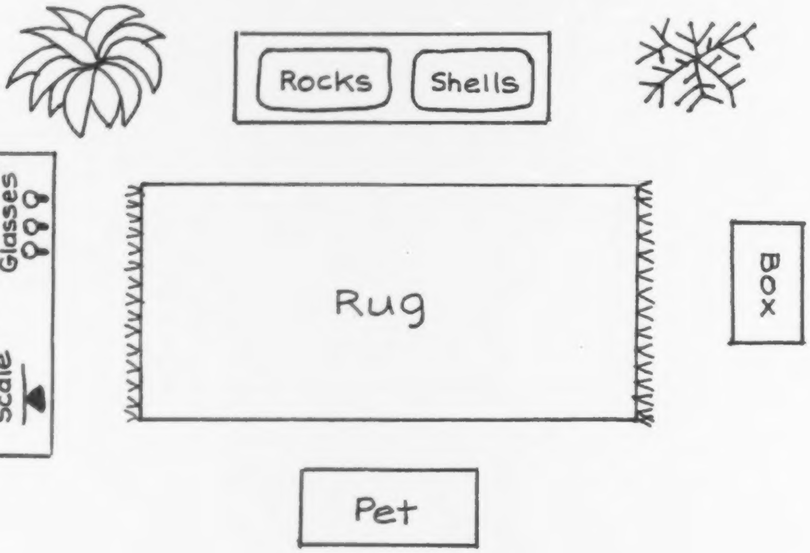

½ Units
Units
Double Units
Triangles
Cylinders
Animals
Vehicles

Appendix 3

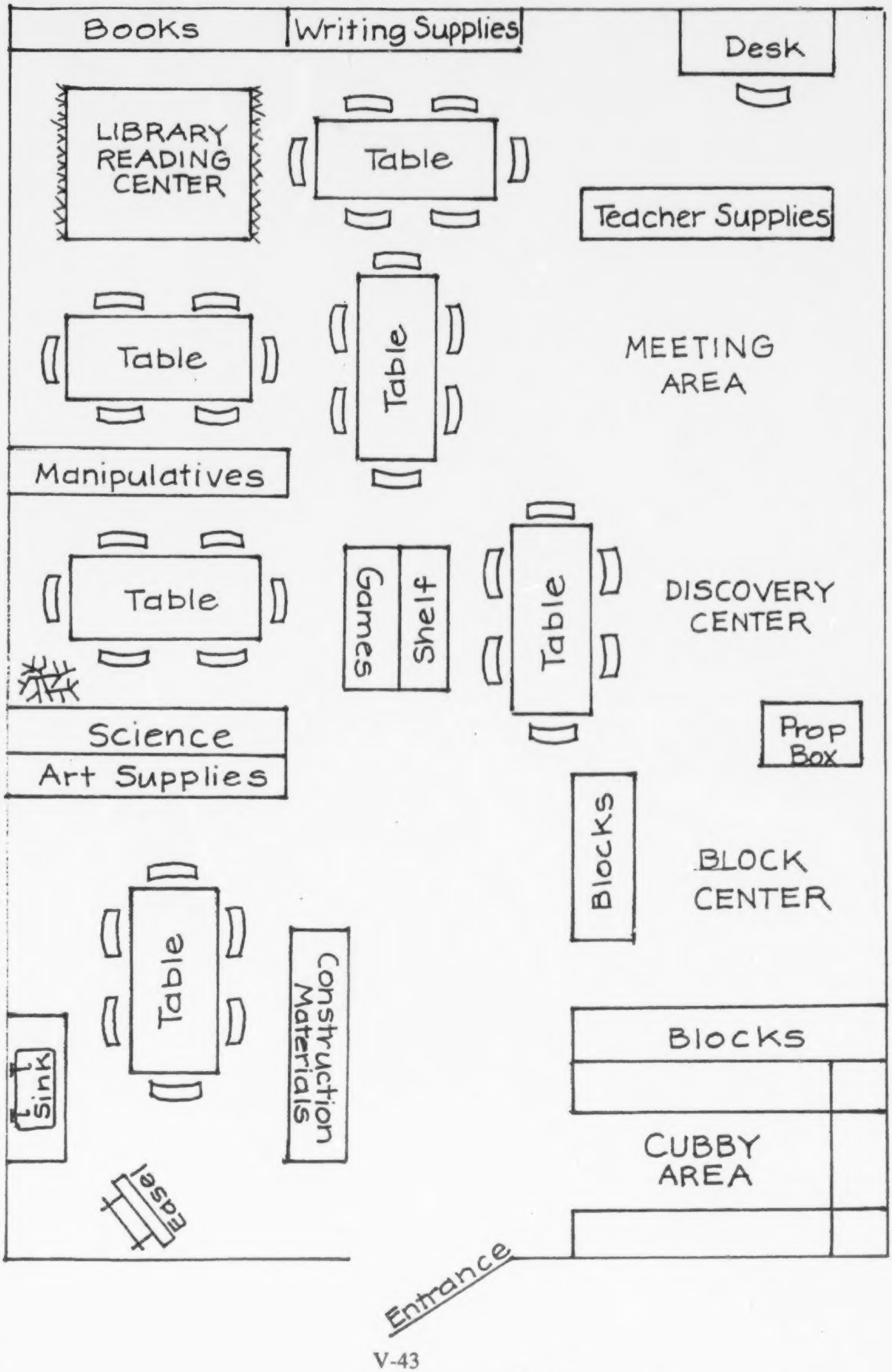
LIBRARY/READING CENTER
(with optional materials)


Cassette player
Headphones
Rug
Book Shelf
Pillow
Games
Pillow

SCIENCE CENTER
(with optional materials)


Rocks
Shells
Magnifying Glasses
Balancing Scale
Rug
Box
Pet

Appendix 4a


Books
Writing Supplies
Desk
LIBRARY READING CENTER
Table
Teacher Supplies
Table
Table
MEETING AREA
Manipulatives
Table
Games
Shelf
Table
DISCOVERY CENTER
Science
Art Supplies
Prop Box
Blocks
BLOCK CENTER
Table
Construction Materials
Blocks
Sink
CUBBY AREA
Easel
Entrance

Appendix 4b

DISCOVERY CENTER

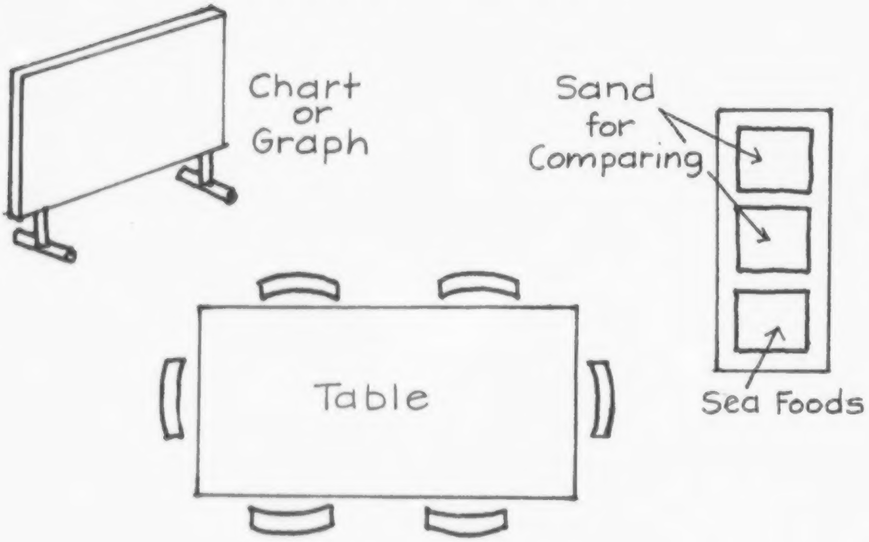
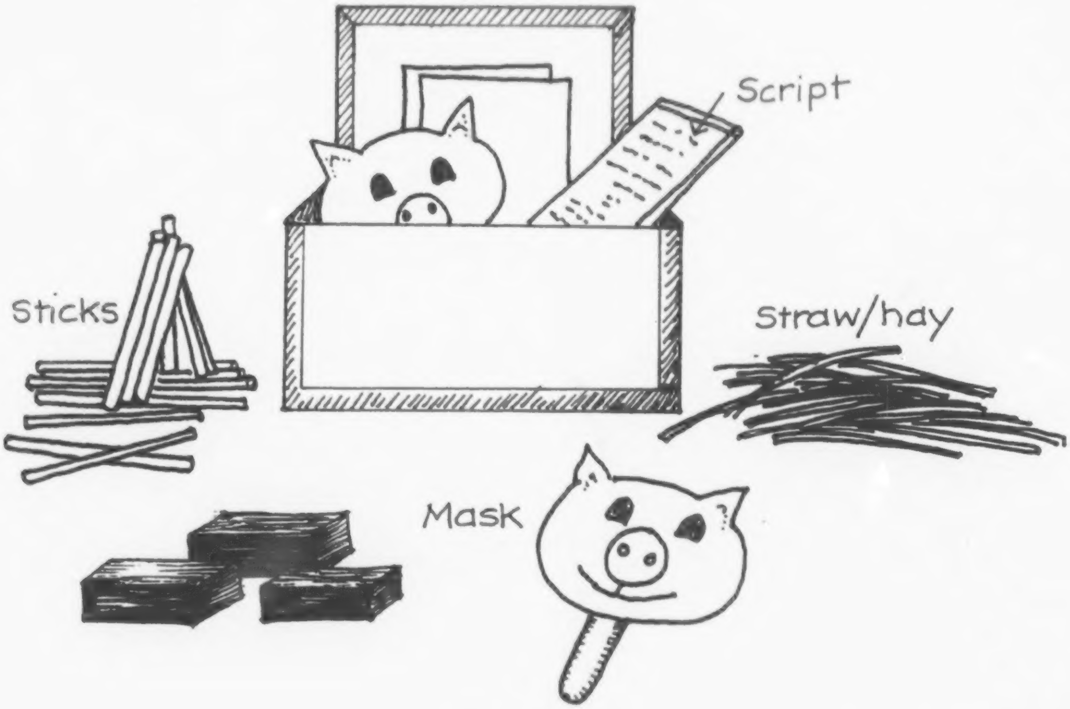
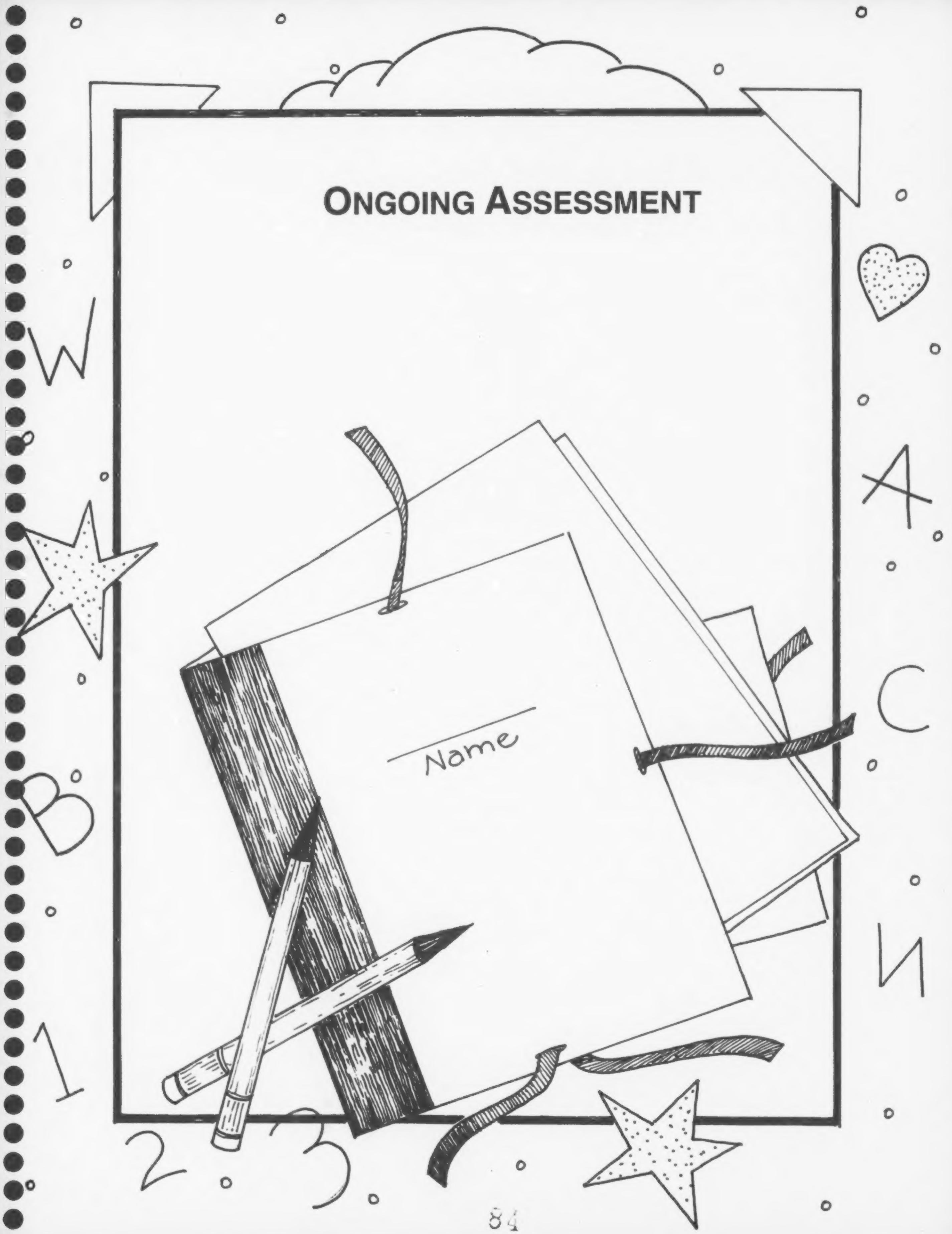


Chart or Graph
Sand for Comparing
Table
Sea Foods

DRAMA (PROP BOX)


Script
Sticks
Straw/hay
Mask

ONGOING ASSESSMENT



VI. ONGOING ASSESSMENT

> *Assessment and accountability are worthy goals. The task is to create a system that usefully and fairly assesses what we care about and that does not distort the process of learning.*
>
> Theodore Sizer

Philosophy and Rationale

Learning and development are constantly in a state of change. As a result, educators must stay current in the area of assessment. A developmental primary program is based on nurturing the continued growth of young children's knowledge and understanding of themselves and their world.

Ongoing assessment that occurs in the context of classroom activities can provide an accurate, fair, and representative picture of children's abilities and progress. Traditionally, assessment has focused on student accountability using frequent pencil and paper types of assessments such as graded worksheets, weekly mastery tests, and standardized tests. Teachers have tended to assess children's work to provide themselves, parents, and administrators with numerical proof of student progress. However, recent trends in education have found educators exploring and creating alternative methods of evaluating and assisting children's growth. The adoption of a whole-language approach to education, where students are actively involved in the integration of listening, speaking, reading, and writing, has encouraged a new perspective for evaluating. These aspects have been incorporated to give a more accurate assessment of the child. "Authentic" assessment, as opposed to "on demand" performance assessment, is a form of evaluation that occurs continually in the context of a meaningful, developmental learning environment. It reflects actual and worthwhile learning experiences that can be documented through observation, anecdotal records, journals, logs, actual work samples, conferences, portfolios, performance tasks, and other methods. Authentic assessment is meaningful to students and is conducted in the process of learning, as evaluation is paramount to student growth.

"Individual assessment of children's development and learning is crucial for planning and implementing developmentally appropriate programs," states the National Association of the Education of Young Children. Several alternative methods of assessment are more appropriate for young children than paper-and-pencil tests. Recent thinking about assessment stresses discovering what children know and can do, rather than focusing on what children do not know and cannot do. Teachers need to observe students complete tasks in familiar contexts where they have many different opportunities to demonstrate their knowledge and skills, rather than rely solely on paper-and-pencil type tests, if teachers wish to find out what their students truly know and can do. Assessment approaches must be geared to the developmental characteristics of children to provide more complete and thorough evidence of a child's abilities and achievements than the test scores are able to provide.

New assessment practices:	*Traditional practices*:
•Are ongoing, cumulative.	•Are annual.
•Use open-ended formats.	•Are multiple-choice.
•Draw upon a variety of settings.	•Are based on a single setting.
•Are criterion-referenced.	•Are norm-referenced.
•Involve student in process.	•Is teacher dominated.

(Chittendon - Edited by Perrone,1991)

Assessment is a means of gathering information and using that knowledge to evaluate student progress and guide the instructional components of the curriculum. Criteria for assessment should include the following:

- Validity
- Many measures for achievement, not limited to standardized multiple-choice items.
- Involvement of the whole child
- Repeated observations
- Continuous process over time
- Use of a variety of methods

(Adapted from CEASL)

The assessment portfolio is a collection of a student's work which demonstrates the child's efforts, progress, and achievements over a period of time. Both student and teacher should be involved in the selection process of the portfolio samples. Assessment according to the Step by Step Primary Program model should incorporate the following assumptions:

- Assessment should nurture children's growth in knowledge, understanding and confidence.
- Assessment should focus on important goals and involve multiple sources of information.
- Assessment should inform and support developmentally appropriate instructional practices.
- Parents and students are essential partners in the assessment process.

(Winograd, 1994)

The ultimate purpose of evaluation is to enable students to evaluate themselves. The focus of good assessment is to allow the learner to become independent and autonomous. Student reflection is an integral part of authentic assessment.

Purpose

The main purpose of assessment is to track children's progress and accurately gauge where the students are, so lessons in the curriculum can meet the needs of individuals and ensure that each child experiences success. Identifying children with special needs who may require additional support or intervention is another reason for assessing. Appropriate assessment should provide an active link between the method of instruction, what is taught, and what is learned.

Authentic assessment should:

- Capitalize on the strengths of each student, rather than finding failure.
- Inform instruction...indicating what to teach and how to teach it.
- Be an ongoing part of instruction.
- Be multidimensional, focusing on social and emotional growth as well as cognitive development.

- Include active, collaborative reflection between teachers and parents, and between teachers and students.
- Emphasize the importance of learning.
- Promote success and optimal learning for all students.
- Be clearly understood by students and their parents

(Adapted from PLAS)

It is important that teachers realize what knowledge their students have mastered and maintained. Observation and documentation of children's performances are a means of gaining this information. Appropriate assessment that is ongoing, in context, and uses a variety of techniques, supports instruction, and enriches curriculum planning. Assessment can and should serve different purposes:

- Students become more self-reflective and in control of their own learning.
- Teachers focus their instruction more effectively.
- Teachers determine which children need more support.
- Parents understand more about their children's progress as learners.
- Administrators understand how groups of students are progressing as learners.
- Educators gauge the level of achievement of students involved in this model.

(Winograd, 1994)

Children's learning and development should be assessed by teachers early in the school year, and continue to be ongoing, thus providing teachers with a basis for shaping their curriculum. Through observation of their students, teachers should modify learning experiences to meet the needs of the children. Authentic assessment is based on the understanding that students and teachers are the most critical audiences and that assessment is administered with a focus on learning. Together, students and teachers engage in the evaluation process so that students can take control of their own learning and teachers can improve instruction. The enthusiasm and optimism surrounding alternative assessment is certainly justified. But change involves challenge, and the changes in the assessment process are no exception.

Audience

Teachers, students, parents, and administrators should all be involved in the assessment process. Teachers should constantly observe their students' growth and learning. Ongoing assessment allows for teachers to talk to their children about their work each day and to use this information as a basis to shape the curriculum. Teachers should share insights gained from this evaluative process with their students so that the children can see the progress they are making and realistically know how they are doing. Teachers should be encouraged to frequently invite administrators to share in the progress of the class as demonstrated by examples of students' work.

Parental involvement in assessment should extend beyond receiving a report card, to viewing actual examples of a child's work over a period of time. Parents will have a much better picture of their child's progress when they see concrete evidence of the child's work. A collection of a student's work over time illustrates the quality of a child's thinking and development. Summarizing the information will provide an efficient and comprehensive way to report to parents. In the section called Portfolio Forms at the end of this chapter there are two forms for parents which involve them in the assessment process. The first is a letter which accompanies the child's portfolio when it is sent home. This letter explains the nature of the work the child has done and what the portfolio is. The second form is a response sheet for parents to provide their observations and thoughts about the child's progress as shown in the portfolio.

Types of Assessment

Traditional testing alone may fail to fulfill the underlying goal of assessment, which is optimal instruction. Authentic assessment attempts to go beyond only using a conventional paper-and-pencil approach of assessment to models that allow a broader range of intellectual capacities as valid demonstrations of competence. A variety of authentic assessments can be utilized throughout the classroom. By using a range of assessment models, a teacher will be able to get a representative picture of the whole child.

Developmentally appropriate assessment practices for young children need to provide a wealth of information about children's physical, social, emotional, and intellectual growth. Informal methods of assessment such as direct observation, anecdotal records, and portfolios of children's work are used to assess what a child actually knows and can do. To promote success of the Step by Step Primary Program model, it is crucial to use these methods of assessment to ensure that the teaching and evaluating are complimentary and that appropriate developmental practices are adopted.

Observation/Documentation

This form of assessment is effective in determining what and how young children learn. Teachers collect an abundance of valid and reliable information within daily classroom activities by objectively observing children and documenting these observations. This information can provide a basis for making judgments about children and the instructional experiences that would be appropriate for them. Observation is something that teachers do all the time. For assessment purposes, observations are sometimes informal and do not include documentation; at other times, observations are done with a clear focus, such as documenting if a child has acquired a specific skill or gained particular understanding. Informal and formal observation, used together, give teachers an accurate view of each child's abilities and skills. These individual observations may take as little as 5 to 15 minutes and can be incorporated in the routine of each day. There are a variety of methods for recording observations including:

- Anecdotal records
- Checklists
- Inventories
- Photographs
- Audio recordings

To assess children fairly, teachers have to observe with a specific purpose in mind. In order to be effective, observations must be systematic, objective, selective, unobtrusive, and carefully recorded. The following guidelines can assist the teacher to perform systematic observations:

- Observe exactly what the child does.
- Record observations as soon as possible.
- Observe children within a variety of settings and at different times of the school day.
- Be realistic in scheduling observations.
- Focus on one child at a time.
- Avoid being obvious.
- Protect confidentially.
- Choose a practical recording system.

(CEASL)

Anecdotal Records:

Anecdotal records constitute an objective description of an observed activity. It can be helpful to use direct quotes from the child. Teachers should review a collection of records over time to gain insight and draw conclusions about a child's progress. These guidelines will be of assistance when using anecdotal records:

- Determine what to observe.
- Put the anecdote in context, recording the date, time, and setting.
- Make the anecdote precise and specific.
- Keep the anecdote objective.
- Keep the recording process simple

(CEASL)

See examples at the end of this chapter.

Checklists and Inventories:

These are easy and time efficient tools for recording observations of children. They specify concrete behaviors to be observed and are a common and useful way of monitoring a young student's progress. Typically, developmental checklists state skills in the order of sequence that they are learned. Checklists are developed in advance of the observation and are useful for assessing children in activities, providing information about what a child can and cannot do in each developmental area.

See examples at the end of this chapter.

Photographs and Audio Recordings:

These are records of concrete evidence of young children's performances.

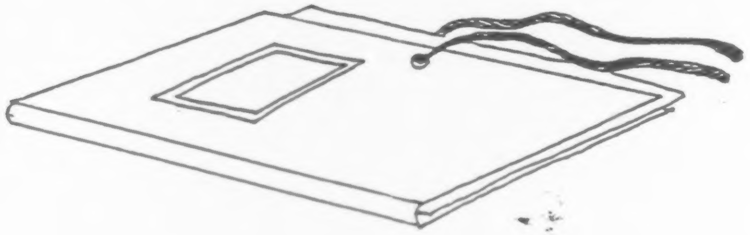
Assessment Portfolios

Portfolio assessment is a method of evaluating a student based upon a collection of the student's work. Its usefulness and credibility depend upon the expertise of the classroom teacher.

Portfolios serve the purposes of:

- Fostering the integration of instruction with assessment.
- Providing students, teachers, parents, and other decision makers with appropriate information about a child's progress and various classroom activities.
- Enabling children to participate in the assessment of their own work.
- Enabling teachers to keep track of individual student's progress.
- Forming the basis for evaluating the quality of a child's overall performance from a variety of sources.

(Adapted from CEASL)



Portfolios are established by a process that is somewhat subjective. When helping to choose samples of students' accomplishments, the teacher may wish to reflect on the following questions:

What is good for this particular student?

What are the qualities evidenced in this example that demonstrate development and progress in the child's learning?

How does this sample of work relate to other samples in the child's portfolio?

Using portfolios for reflection and evaluation provides a rich source of information about a child's growth and development. An assessment portfolio is valuable in early childhood education because it supplies a record of a child's process of learning.

Common goals of portfolios are:

- To illustrate the student's actual work.
- Enhance teacher and student participation in evaluation.
- Satisfy accountability concerns.

Types of Portfolios:

The Collection Portfolio is a simple folder that holds student work. It is intended to be used by the student and teacher. Ideas for the Collection Portfolio could include:

- Writing—samples of all drafts and final copy, including samples from all content areas (social studies, science, math), writing checklists, research reports, journal entries, learning log entries
- Reading—inventories and checklists
- Responses to reading—book reports, open-ended questions with scoring rubrics
- Tape recordings of oral reading
- Photographs of projects and activities
- Mathematics checklist and problem solving samples

The Student's Showcase or Display Portfolio is a container/folder/box of work that shows a student's progress through achievement. It may contain work done in one curriculum area or include several disciplines. This portfolio is intended for public display and may be shown to parents. Ideas for the Student's Showcase or Display Portfolio include:

- A selection of items from the Collection Portfolio showing: best work, growth over time.
- Student's reflections on selections or general progress .
- A self-esteem folder including: newspaper clippings, photographs.

The Teacher/Student Assessment Portfolio is a collection of documentation that assesses a student's progress and supports a cumulative evaluation. It contains copies of work in the student's Display Portfolio, teacher-written tests, anecdotal records of observations, and anything else the teacher deems necessary. This portfolio is not intended for public display but is shared with the children and parents. Ideas for Teacher/Student Assessment Portfolios include:

- Copies of material from the Showcase Portfolio
- Anecdotal records
- Conference records
- Interest inventories
- Teacher-made tests: open-ended tests, unit tests

Record keeping is an important part of portfolio assessment, as it reflects what a student is doing. Records kept represent the range of achievement, the processes that are going on, the effort that is shown, and the improvement that is demonstrated. A large portion of this record keeping is done by selecting appropriate samples for the portfolios. These samples are most meaningful when accompanied by checklists, conferencing notes, and anecdotal records which contribute to a narrative assessment. It is important to date the students' work so that progress can be documented in the sequence that it occurs.

Rubrics

Rubrics are a set of scoring guidelines that students see before beginning an activity. By viewing established criteria prior to the activity, students are aware of what is expected of them in order to receive a certain score. A rubric identifies specific qualities the teacher expects to see and corresponds to several points on a scale. A typical rubric contains a range of possible points to be assigned and provides different traits to be examined and assessed. A rubric signifies that the assessment is criterion-referenced and demonstrates a certain level of mastery.

See examples at the end of this chapter.

Teacher/Student Conferences

Conferences are an opportunity for a teacher and student to discuss the student's work. Conferences should be conducted in a safe and comfortable manner so the student feels encouraged to take risks and share his or her ideas. These discussions can be brief and informal or they can be structured and systematic. The teacher should use this time to review and analyze what the student has been doing and to help the child in planning and implementing the next steps. Most structured conferences follow a predictable pattern where the student has a clear idea of what is expected of them. Conferences are often centered on something specific; a book being read, a story that has been written, or a work in progress. Teacher and student conferences are an important method of authentic assessment because they provide information about:

- What the student is learning.
- The student's understanding about reading, writing, mathematics, and other aspects of the curriculum
- The nature of student's interests.
- The area where the student needs help.
- What things the teacher is doing that the teacher feels is most helpful.
- What things the student would like to learn next.

(Winograd, 1994)

Student Self-Evaluation

Student self-evaluation is an important part of authentic assessment. It allows students to rate their own progress and take ownership and responsibility for the process, as well as the product. Journals, reading records, learning logs, checklists, inventories, and student's written reflection on their own work is useful in tracking their progress. Children's investment in their learning and the quality of their work increases when teachers involve them in setting personal goals and evaluating their own progress. Children often want to know the expectations and standards that their teachers and parents have for them, how they are being evaluated, and the progress they are making. Encouraging children to set their own goals helps them become self-directed learners. By modeling the language and process of setting and striving for personal goals, teachers foster self-directed learning. To help encourage the self-evaluation process, the following questions can be asked of each student and documented in a journal:

> Which of my skills improved last year?
> What can I do very well?
> Which skills can I improve?
> What is the one thing I really want to work on this year?
> What do I hope to learn this year?

When teachers provide opportunities for children to think about what they have learned, the students become aware they have accomplished something, or they know something now that they did not know before. In the process of reflection, children may observe that they have tried something for the first time. When they review samples of their work over a period of time and see the progress they have made, they have concrete evidence of their growing competence.

Paper-and-Pencil Tests

Customarily, paper-and-pencil tests were an integral part of assessment. While current assessment practices stress the need for a variety of assessment methods, paper-and-pencil testing should not be completely discarded. However, teachers need to be aware of the limitations this type of assessment poses. Teachers are encouraged to make tests as relevant to the actual activities as they possibly can. The use of open-ended questions ensures a variety of responses and reflects what the students really know.

It is only fair that teachers use test results to measure the individual progress of a child, rather than comparing children's progress with each other. A fixed standard or criteria for measurement allows the student being evaluated to be measured against a standard of mastery, as opposed to being measured against other children.

Summary

To be able to make informed decisions about children's education, accurate assessment of students' learning is essential. Observing children as they read, write, interact with others, and engage in all the activities available in a developmentally appropriate curriculum assists teachers to gather information about each student. Anecdotal records, checklists, portfolios, teacher/student conferences, and student self-evaluations are tools and techniques to help teachers accurately assess their students and become more effective at communication. To obtain a reliable, honest, and representative picture of a child's abilities and progress, the process of assessment must be ongoing, thorough, and conducted throughout all classroom activities. The Step by Step Primary Program promotes an approach to assessment that incorporates a variety of techniques and enables teachers to accurately share students' progress with parents and others in a way that is most meaningful.

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OBSERVATION AND DOCUMENTATION

Anecdotal Notes

Name: ______________________________

Performance: _________________________

Anecdotal Records

INDIVIDUAL READING RECORD			
Name ____________________________			
Date	**Title**	**Comments**	**Instructional Strategies**

CHECKLISTS

Anecdotal Records

Individual Reading Record

Name

<table>
<tr><th>Date</th><th>Title</th><th>Comments</th><th>Instructional Strategies</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">MONTHLY WRITING SAMPLE</td></tr>
<tr><td colspan="4">MONTHLY WRITING SAMPLE</td></tr>
</table>

Early Readers Checklist

Early Stage	Frequently	Sometimes	Rarely
Set purposes for reading			
Take risks			
Use text to predict and verify recognize errors made in own reading			
Use fix-up strategies			
Self correct to gain meaning			
identify important information			
identify and understand story elements			
Discuss the author's style			
Respond to text in a variety of ways			
Activate background knowledge to respond to new information			

Name ______________________ Date _____________

Reading Checklist

Key
C = Consistently
O = Occasionally
S = Seldom

	C	O	S
The student demonstrates interest in and loves reading.			
The student takes risks.			
The student can get lost in a book.			
The student chooses to read when given a choice.			
The student displays confidence as a reader.			
The student has favorite books.			
The student can elaborate on a book.			
The student makes predictions about what will happen in the story.			
The student asks questions to clarify meaning.			
The student remembers pictures and text to support and clarify ideas.			
The student can retell a story with:			
Beginning and ending			
Main points in sequence			
Details			
The student shares insights gained by reading.			
The student can talk meaningfully about:			
Character			
Setting			
Events			
Problem			
Solution			
Tension			

Name ________________________ Date ______________

Oral Language Checklist

Key
C = Consistently
O = Occasionally
S = Seldom

	C	O	S
The student can use expressive language to:			
Compare and contrast			
Sequence events			
Name common objects			
Distinguish important from unimportant			
Articulate personal plans			
Relate personal experiences			
In conversation, the student can:			
Initiate conversation			
Wait to share			
Disagree without disrupting			
Ask for clarification			
Elaborate			
Respond appropriately			
Remember an idea while waiting			
Stay on topic			
The student can articulate correctly:			
Sounds			
Words			

Name ______________________ Date _____________

Listening Checklist

Key
C = Consistently
O = Occasionally
S = Seldom

	C	O	S
The student makes eye-to-eye contact with the speaker.			
The student listens with interested expressions.			
The student turns body toward the speaker.			
The student listens to and follows:			
One direction			
Two directions			
Two or more directions			
The student can attend to:			
One-to-one conversations			
A story			
Class discussions			

Name ______________________ Date ______________

Writing Skills Checklist

Key
C = Consistently
O = Occasionally
S = Seldom

	C	O	S
The student demonstrates ability and interest in writing.			
The student takes risks.			
The student makes connections from reading to own writing.			
The student is making progress toward conventional writing through:			
Pictures			
Scribbles			
Random letters			
Labeling (words)			
Sound-letter correspondence			
Spaces between words			
Sentences			
Punctuated text			
Some conventional spellings			
The student is writing text that demonstrates appropriate:			
Length			
Descriptive vocabulary			
Original ideas			

Name ________________________ Date ______________

Skill Development Checklist

Key
C = Consistently
O = Occasionally
S = Seldom

	C	O	S
In own writing, the student uses:			
Correct initial consonants			
Final consonants			
Blends			
Word endings			
The student recognizes punctuation:			
Period			
Question mark			
Exclamation point			
Quotation marks			
In own writing, the student attempts to use correct:			
Punctuation			
Capitalization			
The student can correctly sequence stories and events:			
Orally			
In written work			
The student understands real versus fiction.			
The student attempts to use correct form for a letter.			
The student can read a graph:			
Real			
Symbolic			
The student can sort by:			
Size			
Color			
Other attributes			
The student uses the words, more, less, the same, when describing graph data.			

PORTFOLIO FORMS

Letter About Sending the Portfolio Home

There will, of course, be times when parents cannot come to school to view and discuss the portfolio. In these cases, you may wish to send the portfolio or a copy of it home to be reviewed. This letter will establish the fact that the portfolio is coming home. The parent is invited to respond on the form that follows on the next page.

- -

Date:

Parent of ___________________

Your child will be bringing his/her portfolio home for your review. The portfolio is a collection of your child's work.

Please go through it with your child, asking questions as you go, and responding on the form that will be included. We are eager to get your reaction to the progress your child has made.

Because the portfolio is a part of our on-going instructional program, we ask you to return it to school the same week you receive it.

Thank you for your help and cooperation.

Sincerely yours,

Response to At-Home Look at Portfolio

This form can become part of your records after the parent has reviewed the portfolio at home. It will provide a good indication of how well you have been communicating about portfolio assessment.

Parent Response Form

Date: ________________________________

Name of Student: ________________________________

Please answer the following questions:

Did your child review the portfolio with you? ____________________

What part of the portfolio did you like best? ____________________

____

Did your child's progress come as a surprise to you? Why?

____

____

Do you have questions about anything in the portfolio?

____

____

____

I have reviewed the portfolio and am returning it with this form

____

Parent

PORTFOLIO CONTENTS

	Title	Date	"Why I Chose This?"
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

LANGUAGE ARTS/INTEGRATED CONTENT AREA PORTFOLIO

GOALS OF INSTRUCTIONAL OUTCOMES

1) Can communicate clearly through writing in a variety of disciplines.

Developmental Level Continuum

Recording Date **Beginning Developing Skillful/Independent**

2) Is enthusiastic about reading and chooses books appropriately.

Developmental Level Continuum

Recording Date **Beginning Developing Skillful/Independent**

3) Shows fluency, comprehension and ability to apply through reading.

Developmental Level Continuum

Recording Date **Beginning Developing Skillful/Independent**

4) Can communicate clearly through speaking in a variety of disciplines.

Developmental Level Continuum

Recording Date **Beginning Developing Skillful/Independent**

RUBRIC
FORMS

TEACHER / STUDENT CONFERENCING FORMS

It can be duplicated and used for keeping your own conference records.

Student Conference Record for Reading

Date: ____

Student's Name:

What is the title of the book you are reading?

____

Who wrote it?

Have you read other books by this author?________________________

Why did you choose this book? ____________________________

____

Tell me something about the story so far.

____

____

What would you like to do when you finish this book? (Options: write a report, draw a poster, give an oral report to the class, write a letter to the author, etc.)

____

Would you like to read another book by this same author? Why?

____

____

Teacher Comments: ______________________________

____

____

It can be duplicated and used for keeping your own conference records.

Student Conference Record for Writing

Date: ____

Student's Name:

What is the title of the piece you are working on now?

____

What kind of piece is it? (Story, poem, essay, report, etc.)

How far have you gotten in the writing process? (rough draft, self-editing, peer editing, polishing) ____

____

What do you plan to do next with this piece? ______________________

____

What do you like best about this piece?

____

____

Is there anything you would like to change on this piece?

____

____

Teacher Comments: ____

____

____

SELF-EVALUATION FORMS AND LEARNING LOGS

Student Self-Evaluation

Name _______________________ Date________________________

Did I like my project?

Did I do my best work?

Did I use different ideas?

Did I need help?

Can I do more on this topic?

Will I share my work?

READING/WRITING OBSERVATION FORM

1. Write the name of each child in the class, one name per square.
2. Duplicate.
3. At the end of the week, or observation period, cut apart and attach individual squares to each child's Weekly Observation Record (see following page).

Name ***Jane*** Date ***10/26*** ***Identified Children's names on the job chart.***	Name ***Carlos*** Date ***10/26*** ***Composed message on message board.***	Name Date
Name Date	Name Date	Name Date
Name Date	Name Date	Name Date
Name Date	Name Date	Name Date
Name Date	Name Date	Name Date

FAMILY PARTICIPATION

VII. FAMILY PARTICIPATION

> *The true security is to be found in social solidarity rather than in isolated individual effort.*
>
> Dostoyevsky

Young children enter primary school with a tremendous amount of knowledge and many skills. They have acquired speech and can communicate with others successfully. They have a wide repertoire of self-help skills such as eating, dressing, personal hygiene, and the management of simple tools. They have an awareness of manners, social customs, and strategies for interpersonal relationships. An individual's basic sense of self and approach to the world is also established in these early years. How was so much learned in only five to seven short years? The unique and powerful relationship between parent and child is at the heart of such remarkable growth. The parent is the first teacher in their child's life.

The Step by Step Primary Program recognizes, respects, and supports the importance of the parent's role as first teacher of, and expert on, their particular child. As in the Preschool Program, the Primary Program views the parents as partners with teachers in educating children.

What makes a family? In today's changing society the family unit is defined in new ways. We recognize that families are as diverse as the members within them. Large, extended families with relatives living together or small families with a parent and child are all valued for their primary influence on the children. Parents are the first models for problem solving, cooperation, and sharing. Parents intentionally instruct their children in becoming part of a community and a larger society. Parents hold the same broad goals for their children that teachers have for all children. As James Hymes writes in *Teaching the Child Under Six*:

> *Parents are as convinced as any teacher on the worth and importance and dignity of the individual. The individual, after all, is their child.*
>
> *Parents know about readiness and motivation, although they may not know these words. They have lived with their children and have had to take these ideas into account (1974, p. 157).*

> *Parents know what young children are like. They know their activity. They know their egocentricity. They know their shyness. They know noise level and their imagination, their messiness, their sociability. Parents have lived with their children since birth.*

The Step by Step Primary Program believes in the collaborative responsibility of the parents and school in providing for the success of each child in all areas of growth. The teacher must communicate the desire that the school will work with parents to be a place where the child comes first. Research has shown that the effects of such a union result in the child's personal and academic growth. When children see their parents involved in school and working with the teacher their feelings of importance are enhanced. All children benefit from a positive, friendly relationship between home and school. It allows for clear connections to be made. Children receive the message that the important adults in their world care about them. When a program treats their parents as active partners with the teacher it motivates them to do well. Students should sense a commitment to their well-being on the part of both parents and school personnel.

How can schools and parents work together as partners? A successful parent / school connection can be achieved in two essential ways:

1. Consistent, clear, two-way communication.
2. Varied avenues of involvement.

Communication

The parent/ school connection is based on trust. Effective communication builds mutual trust. To launch a real partnership with parents, teachers can begin by thinking about what they can learn from the parents about their children. The Step by Step Primary Program views parents as the most important consultants in helping to better understand individual children. For two-way communication between teachers and parents to be successful, teachers must use effective listening skills. Listening attentively to parents sends valuable messages towards establishing an open, mutually supportive relationship. Positive listening skills help teachers create a climate for collaboration.

Listening has been described as a four-part process. It involves hearing, interpreting, evaluating and responding. While meeting with parents, it is important to remember that listening involves all four steps. Active listening and reflection are important tools in the flow of information between parent and teachers. Active listening means, literally being active in the listening process. The following diagram illustrates the flow of communication when using active listening as a communication tool.

Parent as sender of message:	Teacher as receiver of information:
1. States message.	1. Focuses on sender's purpose and intent.
2. Hears what is conveyed	2. Paraphrases & repeats important parts of message.
3. Determines if listener understood intent.	3. Works to fully understand sender.
4. Clarifies message.	4. Remains open to sender throughout.

Through active listening, and especially through paraphrasing, the messages that are sent and received in authentic two-way communication may be more accurate, better understood and more pleasant.

A variety of styles are available to teachers in considering communication opportunities with parents. When speaking with parents a teacher should try to be:

> *Friendly* - The friendly communicator is encouraging to people, acknowledges other's contributions, openly expresses admiration and respect, and tends to be tactful.
>
> *Relaxed* - The relaxed communicator is calm and collected, not nervous under pressure and does not show nervous mannerisms.
>
> *Attentive* - The attentive communicator likes to listen to the other person, shows interest in what the other is saying, and deliberately reacts in such a way that the other knows he is being heard.
>
> *Animated* - The animated communicator provides frequent and sustained eye contact, uses many facial expressions, and gestures often.

Impression Leaving - The impression-leaving communicator tends to be remembered because of stimuli she or he projects.
(from Norton's communicator style variables)

Through regular opportunities in two-way communication, parents and teachers forge a close partnership to support the children.

Parent Conferences

In the Step by Step Primary Program, parent and teacher conferences occur on a regular schedule to ensure consistent communication about the progress of each child. Additionally, ongoing, informal dialogues take place on a more frequent basis. The first meeting with parents takes place the week before school begins. The purpose of this meeting is to get acquainted. At this time the teacher meets the child and parents, listens to what the parents would like for their child in the coming school year, and establishes a friendly, open relationship that will continue throughout the year. The teacher learns from the parents as they collaborate to set goals for the year. The following is a list of some questions a teacher might ask to solicit information from parents:

What would you like your child to gain from this year's school experience?

What activities do you most like to share with your child?

Are there special experiences or events in your child's life that you want us to be aware of?

What are you most proud of about your child?

Where is your child's favorite place to play?

What are some favorite games and activities?

What does your child do when he or she is upset? What is the best way to comfort him or her?

What else would you like us to know about your child?

How would you like to be involved in the class and school this year?

It is important to remember that respect and confidentiality should be maintained when discussing such topics in the presence of children. Adults must be discreet in their conversations.

Experience in schools has shown that the interactions that occur, formally or informally, between teachers and parents set the tone for future involvement of parents. As Holland states:

> *If teachers are to encourage successful parent participation, they should initiate active, personal, persistent, flexible, and positive communication efforts with parents. Teachers must believe that parents are an integral part of the educational program and expect parents to participate.*

The parent conferences that take place during the course of the school year should share the same characteristics. These are:

Preparation - Teachers should begin preparing for parent conferences as they design the classroom environment at the beginning of the school year. As the first few weeks of school proceed, the teacher keeps anecdotal records of each child, more formal individual assessments, and samples of each child's work in a file. This file holds a "picture" of the child's growth over time. In preparation for parent meetings, teachers should review any notes, records, developmental checklists, reports of earlier conferences, parent concerns, and stated goals for the child. It is advisable to write down items of importance such as activities that the child particularly enjoys, special friends, and observations summarizing the child's experiences in all areas of development. Thoughtful preparation is characteristic of a professional approach to the parent/ teacher conference. Plan conferences that are at convenient times for parents. Have paper, pens and paper available. Be prepared to listen, encourage parents to talk.

Location - Teachers should take time to create a proper conference setting. This effort is considerate of the parents who may be worried and hesitant to attend the meeting. The director should help make time and space available for the conferences. If the meeting is to be a productive, exchange of communication then privacy is an important component. Teachers need to be sensitive to the hidden messages that barriers, such as a desk between parents and teacher, can imply (Chin, Winn,& Walters, 1978). "A good room arrangement is to sit in adult-sized furniture around a low table so the child's work and any other items can be displayed and discussed. Proper lighting, ventilation, and temperature are also necessary to help focus attention on the child." (Bjorklund & Burger, 1987) The location should be free from disturbances. The arrangement of furniture should convey that this is a meeting of peers who are together to share information.

Content/structure - The conference structure should be a three-part meeting based on an outline of information to be shared in a manageable amount of time. Set a tone of friendliness by offering a refreshment. Identify strengths of the child, be prepared to share anecdotal behavior, art work, examples of class work, stories the child has written. Discuss with the parents social and emotional goals, academic and cognitive goals, and physical goals. Explain how these goals will be met; share strategies and plans. Berger (1981) recommends that in a parent/teacher conference, the teacher speak no more than 50% of the time.

Follow-up - Teacher follow-up to the conference is very important in establishing openness to continuing dialogues. If parents expect response from the teacher, she should do it immediately. Depending on the content of the conference, a response might include referrals to other resources, scheduling another conference, a telephone call, a home visit, a written report, an informal note to the parents on a regular basis, an evaluation form asking for suggestions about conference format, and informal daily chats with parents.

Why is follow-up so important? Follow-up with parents helps to achieve many goals of the Step by Step Primary Program:

- It reaffirms the partnership between home and school.
- It is a way to let parents know that the teacher and school are reliable and caring.
- It helps to enhance consistent communication efforts.
- It offers opportunities to extend classroom learning at home.
- It helps the school serve parents by getting information for program planning.

Louis Malaguzzi eloquently states in *The Hundred Languages of Children*:

> *Teachers ... must discover ways to communicate and document the children's evolving experiences at school. They must prepare a steady flow of quality information targeted to parents (which) introduces parents to a quality of knowing*

> *that tangibly changes their expectations. They reexamine their assumptions about their parenting role and their views about the experience their children are living and take a new and more inquisitive approach toward the whole school experience (1993, p. 63-64).*

The Benefits of Parent and Teacher Collaboration

When families are actively involved in primary school classes, teachers, parents, and children can all benefit. Teachers create an open atmosphere for involvement by encouraging parents to ask questions, visit classes, and to share their interests and skills.

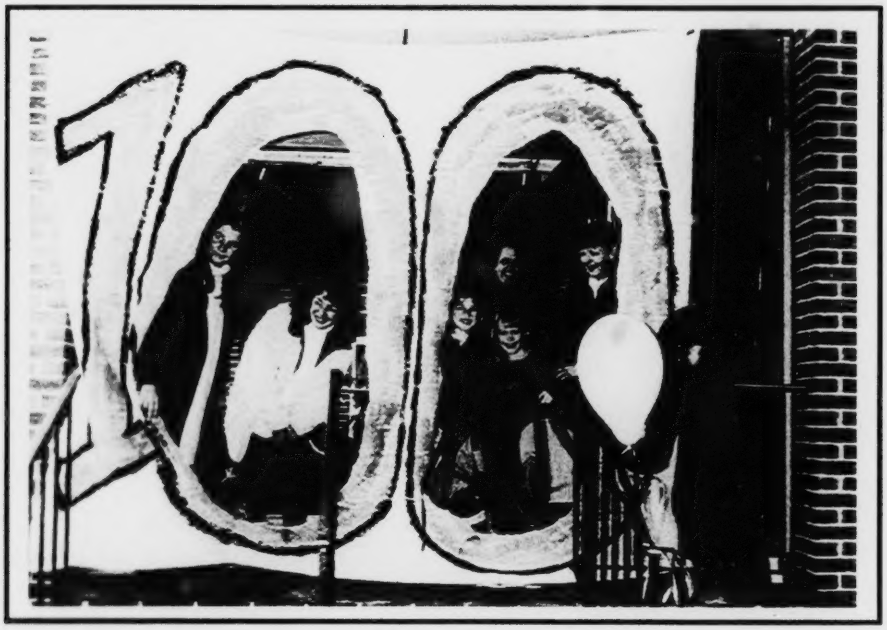
In order for teachers to genuinely be open to parents, teachers must also believe that the presence and involvement of parents is beneficial. To act on this belief, teachers must take the first step by including a parent in a classroom activity. For example, she can invite a mother to help with a class cooking project. The teacher, mother, and teaching assistant would each have a small group of children to work with for the cooking activity. As the children finish their part of the activity, they go to the large group area where another parent is quietly reading a story. In this way the presence of two parents makes it possible for a teacher to structure a complicated cooking activity for small group work. The parent who is reading provides an important way to transition from cooking to another activity. The teacher is better able to manage many activities and children while maintaining a classroom that offers choice and a variety of instructional groupings.

When parents are involved in the classroom, teachers have the opportunity to observe first hand how parents motivate their children, how they help them solve problems, how they help their children approach a task, and how the parent and child share special interests and hobbies.

Parent involvement helps teachers achieve the goal of individualizing. It is by communicating with parents that teachers are able to gather information about each child in the class. Parent involvement offers teachers the chance to be less isolated in the classroom. Teachers and parents can mutually support one another in providing interesting activities and projects for the children which would be impossible to structure with only one adult in a class. When parents feel part of their children's learning, they come to appreciate the teacher's efforts in presenting a new, exciting way of teaching and learning. Their excitement generates new ideas and positive expectations for their children.

Consider one school's experience with an active and excited parent group:

> A few teachers wanted to recognize the 100th day of the school year in a special way. The six- and seven-year olds were fascinated by the number 100 and talked about living in a school for 100 days. One teacher mentioned the 100 days of school to a parent who talked to other parents who became very enthusiastic about the idea of a "whole school" celebration on the 100th day of the school year. The parents developed many activities and suggestions for children, teachers, and parents to do on this special day:
>
> - They constructed an adult-sized doorway in the shape of the number 100 at the entrance of the school that each person had to pass through to enter the building.
> - Parents and their children baked treats with the number 100 on them to share in their classes.
> - Each child brought in a collection of 100 items of a single category to display, for instance: beans, rocks, paper clips (worn as a necklace), pieces of rice, pins. Parents and children were very creative in devising ways to organize 100 small items like these.



The entire day was spent doing mathematics that involved the number 100. Parents were in each classroom, helping with activities. The whole school shared in an exciting day of learning math. All members of the school community were involved. The school-wide celebration provided children, parents, and teachers with the actual experience of coming together as a community of learners.

The teachers in this school are very busy and hard-working, as are teachers in all schools. Normally, they could not have developed such a comprehensive project alone given the amount of routine school work they have. However, they were open to the ideas and enthusiasm of the parents who expressed the desire to work with the teachers on this project, and as a result:

- Teachers trusted parents.
- Parents followed through with the ideas.
- Parents and teachers worked as a team to create a unique, exciting learning experience for everyone.

Volunteering

A friendly welcoming school creates a climate for many avenues of parent involvement. The range of parent involvement is all inclusive from the traditional role of parenting, by providing for the child's basic needs and safety, to assisting with policy making and financially supporting the school. Within this range, parents act as volunteers in many aspects of school life. Some of the possible volunteer duties they may assume are:

- Special event coordinators: Parents contact resources for special programs; they help develop events which support a classroom or grade level project.

- Repair & improvement workers: Parents who help with repair and improvement projects around the school, such as painting or building playground equipment.

- Library helpers: These parents assist in the library by checking and shelving books.

- Science and art helpers: Parents who are willing to help with special art and science projects which require additional adult help.

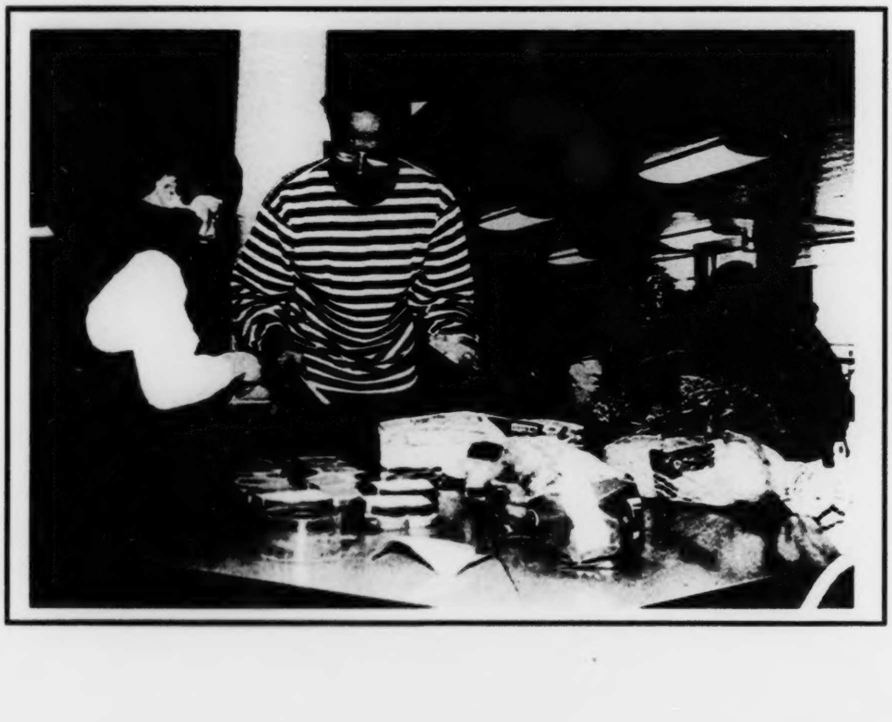
- Playground supervisors: These parents volunteer their time to supervise playground activities to allow teachers time for planning.

- Special birthday party planners: Mothers or fathers who prepare special whole class celebrations for their child's birthday.

- Room Parents: Parents from each classroom in the school assist teachers in various ways, such as making telephone calls to share important information and helping with field trips. They help make new parents feel welcome.

- Fund Raisers: These parents offer their talents and resources to raise money to help support the school financially, such as volunteering to sew in a school sewing project.

As volunteers, parents offer their time, resources and talents to help schools develop a tradition of caring. Volunteering builds community relationships of trust and mutual good will. Every activity is important because it means that everyone has the opportunity to be involved in creating a school which is a true community.



Home and School Communication

The Step by Step Primary Program proposes that regular communication between school and parents is important for many reasons. Open channels for communication are established from the very beginning of the school year. Opportunities to meet and talk about the program, the children and desires of the parents are an established part of the plan for the entire year. The Step by Step Primary Program recognizes that demands on parents are many and varied. With this consideration, it offers a variety of options for communicating in order to accommodate many different schedules. A time to meet with the teacher before school begins in the fall is an established part of the school calendar along with parent conference days which are scheduled twice during the year and at the close of school. Teachers and parents also have informal conversations to discuss issues or concerns as they arise during the school year.

Additional ways of maintaining regular communication with parents about school activities are:

- Weekly or monthly newsletters: These letters provide information about the many activities which the children have been involved in. They are a good vehicle to let the parents know of the learning which happens while children are involved in projects in the classroom.

- Parent group meetings: The parents meet as a group to plan volunteer projects for the school or their childrens' class. They may wish to discuss issues about education or concerns about stages in development. The director attends these meetings and is available to provide educational expertise in the discussions.

- Morning Coffees: This early time of day is often convenient for parents who work to meet with the director or to hear a presentation and have a discussion about educational topics. Teachers announce the topic to be addressed ahead of time, usually in the weekly newsletter.

- Lunch time meetings: Parents come to hear teachers present activities that are successful with children, and that can be done at home. These informal sharing times give parents and teachers a chance to collaborate on positive strategies which work well with children.

- Book Sharings: Parents and teachers share books about good, child raising practices. This can be accomplished in two ways. Either as a written review done by a parent, or through a book discussion group. These are informal meetings of interested parents and teachers who agree to read the same book and gather to share their ideas and thoughts.

- Festivals and celebrations: These celebratory occasions involve the children, parents and teachers. Festivals are held for many reasons, such as, historical or community events, anniversary of the school, seasonal celebrations, or a significant development in the life of the school.

On-going, regular communication benefits everyone in the school community: parents, children, and teachers. Children especially benefit from seeing the significant adults in their lives working together toward a common goal; it increases their sense of security and confidence. Children enjoy the feeling of connection between their families and school.

Parents who visit their child's classroom regularly get a realistic appreciation of their child in a school setting. They are encouraged to share their talents, interests, and expertise as positive models for all the children. In this way parents and children grow in mutual pride and respect. The children are able to see their parents in a new way. Parents, too, gain a perspective as they observe and work with their children in the classroom. They are able to develop a greater awareness of their children's daily experiences.

Experience has proven that difficult issues are more easily addressed when channels for communication are already functioning well. In this way, both teachers and parents have a beginning point from which to work toward resolving disputes, if they arise. Providing parents with options to become involved with children's learning is important so that parents know that the school is willing to make every effort to accomodate their needs. Teachers encourage them by offering different times for scheduling meetings, by providing child care during the meetings, and by furnishing refreshments.

The Step by Step Primary Program model encourages schools to designate a special place in the school for parents. The parent room should be comfortable and home like with a table for meetings, chairs and a sofa, book shelves and materials for writing and note-taking. When a school provides this place for parents, it sends a clear message that it seriously wants parent involvement and respects the contributions that they can make. The Step by Step Primary Program actively promotes parents as partners.

With this goal in mind, The Step by Step Primary Program endorses the establishing of a Parents Association. The purpose of a parents association in a school is to provide a direct link among all the parents, between the parents, and to the school. These adults recognize their shared commitment for what is best for their children as they grow. A parents association is an accepted way for parents to become regularly involved in the school as volunteers, or simply visit their child's class to share a favorite story. All parents are encouraged to take advantage of the many opportunities they have to become part of the life of the school and extend the sense of community to their homes through the parents association. Parents who are active in the association work with the director of the school to create programs for parents and teachers about current educational practices, theories, and programs. The numerous roles available to parents as volunteers should not be limited to those listed in the preceding section. Parents should pursue their interests and ideas as they work with the director to establish a network of support for the school.

A Plan to Include Parents and Other Adult Helpers in the Classroom

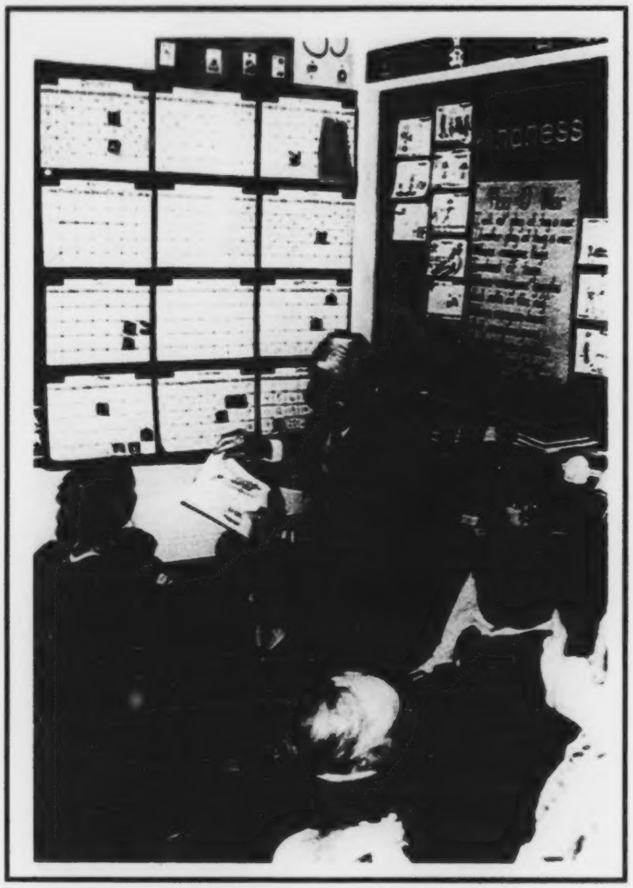
Overview

Using parents and other adults in the classroom is beneficial to children, their families, the adult helpers, and the classroom teachers. These assistants can help children with many activities, especially when they are given encouragement and direction from the teacher. Teachers should work in partnership with the adults in their classroom; this builds trust and provides a model for children. Creating successful programs for adult helpers requires that teachers know how to recruit, orient, guide, and appreciate their adult helpers.

The Benefits of Adult Helpers

Additional adults in the classroom can provide many opportunities for the students. Busy six-and-seven-year-olds can be offered a greater variety of choices and activities when extra adult hands are available to assist in the classroom. For example, adults can be storybook readers or listeners to individuals or small groups of children. They can be stationed at an art, math, or science center in order to encourage and guide the students. Or they can provide individualized help as prescribed by the teacher. The result of this increased instructional attention may also lead to increased student achievement.

When students have their own parents involved in the classroom, they make the positive connection between family and school. Children particularly enjoy having their own parents participate. Getting to know other adults in the community also provides students with new role models. The adult helper may be another student's parent or relative, a senior citizen, or other community member.



Twice a week Mr. Lund, a grandfather of one of the students, came into the classroom to assist the children in measuring, hammering , sawing, and painting wooden projects. He encouraged and praised them as they worked diligently at the woodbench to complete their work. And he often brought wood and other materials for them to use. Each child looked forward to talking with this man who was so interested in them personally; he made them feel important. By the end of the school year, every boy and girl in class had created at least two projects to take home and display! It was hard to say who enjoyed the projects more - Mr. Lund or the children. The following school year, Mr. Lund came back again to help -even though he no longer had any grandchildren in the class.

A teacher will benefit from her willingness to organize and encourage adult assistants in the classroom, it is an excellent way to provide and manage more individualized activities for students. Another benefit for the teacher is the adult helper's first-hand experiences with the school program. By observing in the classroom, the adult helper begins to understand and appreciate the teacher's efforts.

The teacher also benefits because she learns more about the students' families and community life, such as: What are some of the traditions, activities, and rituals in this community? What are some of the special needs and concerns of individual families? As the teacher learns more about her students outside the classroom, she is better able to meet their needs.

When parents and other adult helpers assist in the classroom, they feel good because they are making a contribution and learning new skills. Parents begin to feel part of their child's learning. These experiences can enrich the home-school connection and increase parents' knowledge of appropriate strategies to use with their children.

Over time, the adult assistants find that they are learning first hand about the curriculum and school philosophy. It is an effective way to share with others in the community the exciting things that are happening in the classroom. As the helpers begin to recognize the benefits of the school program, they will tell others about their experiences.

Some teachers will have concerns about beginning a program for adult helpers or assistants in their classrooms. Teachers might be uneasy about having another adult present or unsure of what their role should be with that adult. Sometimes teachers believe that parents or other adults should not work directly with the students. Perhaps the teacher is not sure how another adult might help in the class. Still others may believe that it is not the teacher's job to plan for adult helpers. For many teachers, the concept of working with a classroom assistant will be a new experience.

The best way to deal with these challenges and concerns is to work with all interested staff members to develop an effective program. Together you should identify all the possible benefits. Creating this list reminds people why they should have a program. When everyone strongly believes in the benefits of such a program, it is the best beginning to the process.

Individual teachers or groups of teachers in a school should also identify and discuss their concerns about implementing a program. Through open discussion and the brainstorming of ideas, solutions can be developed. This way each school or classroom can create a program that meets its particular needs.

Teachers can identify the basic steps to developing a strong program for adult helpers. A year-long plan should be outlined and revised throughout the school year. Carefully planning the steps and following through on the plan will help reduce the anxiety of teachers who may be reluctant to have adults in their classroom.

Some schools may decide to develop a long-range plan for using adult helpers, but it is a good idea to start in a small way the first year of the program. Perhaps a workroom for adult helpers can be set up. Teachers might use only a few helpers during the week;

some directly in the classroom and some making the materials in the workroom. By the second year, many teachers will have learned new ways to work with assistants and they will want an adult helper in their classroom every day!

If they continue to meet regularly about the program for using adult helpers, teachers can learn ideas from each other. The most enthusiastic teachers will encourage others to persist with the program and through regular discussion and planning an excellent program will emerge.

Ways Parents and Other Adults Can Help

Each classroom or school setting offers many possibilities and options for utilizing adult helpers. Sometimes assistants may work with individual children or with small groups of children. Adult helpers may prepare materials or activities. Or perhaps assistants will have a special interest or skill to share with the class.

> When Mrs. Reynolds' second child began school, she decided to assist in his classroom. At the beginning of the school year, she worked at different centers with small groups of children. Later, she and the teacher discovered that Mrs. Reynolds was very talented at helping children to learn through cooking projects. She became know as the "cooking mother." Measuring, counting, vocabulary, and writing skills were all part of the weekly cooking projects. Mrs. Reynolds decided that she really enjoyed working with young children, so she applied for a part-time job at the school. She and her family were very happy about her new job which eventually became a full-time position.
>
> The young students were spellbound as they listened to Mr. Lund read with great expression. As a retired teacher of older students, Mr. Lund often decided to read poetry and nature readings to the children. The children seemed to enjoy listening to the rhythm and rhyme of his words. For two years Mr. Lund came once a week to read to his young listeners.

One way to get a list of activities for assistants in the classroom is to carefully review the student's day and think about where children and teachers need helping hands. Think about the very beginning of the day as the children enter the classroom. What are they doing? What do they do as the school day begins? What activities are happening in the morning? How is the room arranged? What is the teacher doing? Where will children need extra help? What happens at lunch? And in the afternoon? What activities might be happening in math, science, literacy, and the arts? What new activities might take place if there were more adults in the classroom?

After you have reviewed the day in your mind, write down all the ideas you have for the ways an adult helper could assist in the classroom. A group of teachers can do this activity together. They can also ask themselves:

> What are some specific ways that a parent or other adult can help with...
>
> - Small groups or individual children?
> - Materials or equipment?
> - Sharing hobbies or interests?
> - Special class projects or events?
> - Learning centers or other tasks?

This activity will generate many ways that assistants can help. From these ideas, teachers can choose those they wish to start with in their classrooms. These ideas also can form the basis of an interest survey to be distributed to potential adult helpers.

Recruiting and Encouraging Participation of Adults

It will be important to recruit and encourage adults to be classroom helpers, especially if your classroom or school is using adult helpers for the first time. Think about the adults in your community who might be able to assist in the classroom. Consider your students' family members such as mothers, fathers, and grandparents. Who are other adults in your community that can help? Senior citizens? Business persons working near the school? Members of service organizations?

> Mrs. Brand knocked on the back door of the classroom one day. She lived near the school and had heard about the classroom helper program. Even though she didn't have any children in the school, she offered her help because she really enjoyed young children. She wondered if the students might like to learn Spanish, her native language. Shortly after completing her classroom orientation training, Mrs. Brand came twice a week to assist with a variety of activities including teaching students some Spanish. At the end of the school year, she returned to assist the teacher with organizing and cleaning up the classroom.

> Mrs. Thomas was the mother of three active girls. Now that her youngest child was in school, she had more time to assist in the classroom. When the teacher sent home a form requesting adult helpers in the classroom, she asked to be involved. After her orientation to the classroom, she worked weekly with students. She also observed that her daughter, Lois, enjoyed her mother's classroom visits. Several months later the school decided to hire a part-time classroom assistant. Mrs. Thomas applied for the job and was hired.

Make a list of all those people you would like to see participate in your program and think about how you can let them know about your program. Here are some ideas for informing and recruiting them:

- Enthusiastic teachers who tell everyone
- Interest surveys
- School newsletters
- Phone calls to organizations and families
- Articles in newspapers
- Posters and advertisements
- Leaflets in community organizations
- Radio advertisements

What are some other ways of reaching adults in your community?

> In the interest survey from her child's school, Mrs. Smith said she preferred to assist several classrooms by making learning centers for the teachers. A small work center for adult helpers was set up by the faculty. The room had table space and materials for making centers, bulletin boards, and other projects. Sketches of possible learning centers and of some actual centers were hung around the room. Some books with ideas for constructing learning centers were also available. A teacher might request one of the center ideas in the room or give directions for a different center idea to Mrs. Smith. Several adult helpers came regularly to make materials. All of them were proud of the learning materials they were able to provide both students and teachers.

As you and your colleagues work on developing the program for adult assistants, use several different ways to find adult helpers. No matter which approach you use, be sure to let potential helpers know some of the ways they might help. And of course, remind them that they will be making a valuable contribution to the students.

Planning An Orientation

Imagine walking into a classroom for the first time and being expected to know about the children, what they are doing, and where the classroom materials are located. This is what we ask of adult helpers if we do not take the time to prepare them before they enter our classrooms. Orienting and training adult assistants are essential parts of developing a successful program. Both teachers and adults will benefit from these meetings.

Before parents and other adult helpers begin to work in the classroom, they will need to attend an orientation that has been planned by the teacher. The orientation will help to answer questions that adult helpers might have and will let teachers share their expectations. Most of all, an orientation allows helpers and teachers to begin to get comfortable with each other and their roles in the classroom.

Invite the adult helpers to attend an after school or evening orientation session. As you plan for an orientation, consider the following important topics or agenda items:

- Welcoming the classroom assistants in a special way
- Explaining the classroom philosophy and curriculum
- Describing the activities helpers might perform
- Sharing the expectations of teachers
- Reviewing classroom procedures and rules
- Touring the classroom facility
- Discussing confidentiality regarding performance and conduct of students
- Assigning and scheduling individual helpers
- Matching the helper's interest and skills with the teacher's and student's needs
- Most importantly, encouraging and answering their questions.

It will help to have written information to give adult helpers whenever possible. At the minimum, each person should receive a written time and date for the first classroom visit and a list of the children's names.

Later in the year, teachers may choose to hold additional sessions for the classroom helpers. Perhaps they will be trained on specific topics or people will come together to share and explore ideas. At the end of the school year, you could plan a special session to recognize the contributions of each adult helper.

Building a Partnership

Teachers and adult helpers must work together to build a collaborative relationship in the classroom. The focus of this partnership is on children in the classroom, for they are the primary reason all the adults work or help at the school. This partnership offers the children a model of how adults can work together to create an exciting learning environment.

Teachers need to take the lead in building the partnerships. The partnership begins at the orientation for classroom helpers. Sending invitations ahead of time and setting up a comfortable, attractive meeting space tells adult helpers that they are valued.

Utilizing the interests and skills of the assistants wherever possible conveys respect for each individual. Listening to concerns and encouraging questions at the orientation indicates that they are important people.

On the first day an adult helper begins in the classroom, the teacher welcomes the adult and introduces him or her to the students. The smiling, inviting teacher sends a very positive message to the classroom assistant. If the adult is a relative of a child in the classroom, ask the child to do the introductions. Let the adult helper observe for awhile and answer questions that may arise. If the adult seems comfortable, get him or her involved with a simple activity with one or two children. Thank the helper before he or she leaves.

During the daily program, teachers should write out instructions and directions for the assistants' activities. This provides clarity and support for the adult helper and frees the teacher to continue with her program. By having simple written plans for the adult, the teacher need only speak briefly to the adult about the day's activity. Materials and instructions for adult helpers can be left in a designated place in the classroom: on a small table, in a decorated box, or perhaps in a large basket.

Recognizing and appreciating the adult helper on a regular basis is vital. Welcome them as they enter the classroom, thank them as they leave, and praise their efforts whenever possible. Encourage their questions, ideas, and suggestions. This approach by the teacher inspires the adult helper to be involved, committed, and looking forward to the next visit. The enthusiasm and respect modeled by the adults in the classroom is contagious; ultimately the children are infected.

Throughout the school year, you may need to address certain issues. Often these are issues of communication and sometimes conflict. Perhaps a helper doesn't let you know that they can't come to school on the day of an important class project. Maybe the adult is not approaching the children the way you desire, or the assistant doesn't understand your classroom procedures or rules.

By tactfully approaching the adults with her expectations and concerns, the teacher can often resolve issues before they get out of hand. Lecturing and reprimanding an adult rarely improves the situation. The best tool the teacher has is her ability to listen respectfully to the assistant after a dialogue regarding the issue has begun. After the listening occurs, the two adults can consider ways to improve the situation. Of course, situations where other adults are endangering children or treating children disrespectfully should never be tolerated.

Remember that you can communicate with all your adult helpers by sending out newsletters or notes with updates, schedule changes, or general announcements. This is also a good way to notify helpers of upcoming events and special training sessions for them.

At the end of the school year, you and other teachers will want to find a special way to thank your helpers. Decide on how you wish to recognize and celebrate their successes. Certificates of appreciation, a luncheon, cards made by the students are just some ideas to consider.

The partnership between teachers and the adults who help in the classroom is worthy of celebration. Teachers who have worked hard to make the classroom assistant program successful will see the rewards. Students gain an enriched learning environment, positive relationships develop, and involved adults are pleased with themselves and the school program.

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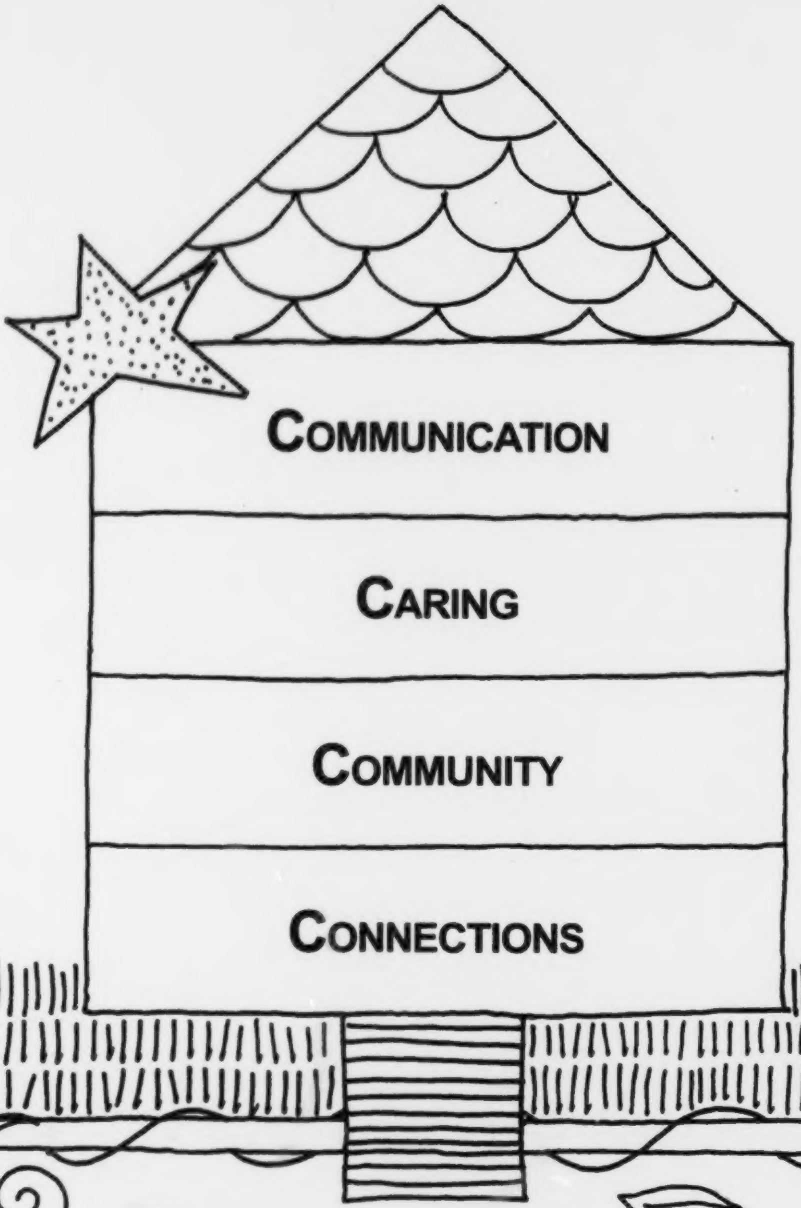
PART TWO:

IMPLEMENTING THE STEP BY STEP PRIMARY PROGRAM

DISTINCTIVE CHARACTERISTICS


COMMUNICATION
CARING
COMMUNITY
CONNECTIONS

VIII. DISTINCTIVE CHARACTERISTICS

I still believe that people are really good at heart.
Anne Frank

Part Two of this document offers a new method for presenting basic subject areas such as mathematics, literacy, social studies, art and science and details more specific ways of addressing the learning of six- and seven-year-old children. As these areas are discussed, four concepts are consistently present and provide the underlying values which are the cornerstones of the Step by Step Primary Program. These cornerstones are caring, communication, connections, and community — the foundation upon which the subject areas are overlaid.

Cornerstones

Caring

Caring is the first cornerstone on which much of the conceptual academic work is built. Children learn to care about and for themselves as they see their parents, teachers, and other important adults in their lives become involved in their early learning experiences. They develop strong, positive self-concepts as they experience success in daily activities. Caring adults demonstrate a responsive attitude which children will emulate as they learn to care for themselves, each other, plants and animals, and their environment. The content areas of the Step by Step Primary Program support the growth of skills necessary for children to become capable care givers. Through literacy development, children learn to formulate and express their opinions in writing and speaking. In mathematics, they learn to value careful thinking, alternative solutions, and the world of currency and numbers. Through science explorations children learn ways to care for themselves physically, for the environment in which they live and for living things in the world around us. In social studies, children come to value an historical perspective. They develop a sense of caring and respect for the people and events that have shaped the present. Art allows children the opportunity to express emotions and ideas. By sharing art experiences and learning about art from other cultures, children recognize that there are things all people care about and have in common.

Communication

Communication is another cornerstone of the Step by Step Primary Program. The ability to communicate clearly is the key to successful involvement in a democratic society. Using an individual approach to learning, teachers encourage children to communicate through speech, a variety of written forms, in mathematics, and many different art mediums. As children develop the skills and confidence to communicate well, they take initiative and are motivated to pursue important ideas. Through communication, children can understand the points of view of others and appreciate both the diversity of thinking and culture, and the commonalities that all people share.

Teachers in the Step by Step classroom recognize that it takes time to teach children the appropriate ways to communicate their important feelings. Teachers model language and actions which communicate a responsive caring attitude. Teachers help children to communicate their needs and in doing so, help them to recognize ways they can respond to the needs of others. Eventually, children learn ways of clarifying misunderstandings and of resolving conflicts through the careful use of language. Good communication is a valuable tool in resolving disputes and building community.

Connections

Connections is the term which describes the ability to link new information to past experiences thus constructing knowledge. The ability to make connections is the third cornerstone which supports the content areas of the Step by Step Primary Program. Children by nature are actively constructing and building knowledge all the time. We are often amazed and amused by the surprising associations that children make in their ongoing efforts to apply new information to known situations. When this happens, they are busy building their repertoire of experiences. The Step by Step Primary Program provides opportunities for discovery, exploration, and practice. Through such activity, young children create experience “links” as they build scaffolds of information structures. Throughout the year, children are encouraged to see similarities among people and the living things which share the earth. They are helped to recognize the connections that exist in cultures, traditions, and language. One teaching method which is based on the concept of connecting information is that of thematic units of study. A thematic unit of study presents a general concept through in-depth study of a topic or object. Chapter XV presents the concepts of change, universality, and variety through an in-depth study of bread. By considering bread and the bread making process from the five subject areas (literacy, mathematics, social studies, science, and art), children realize the interconnectedness of numerous aspects of this particular topic.

Community

Community building takes time and attention. Each classroom in the Step by Step Primary Program is a potential community of learners where showing kindness and care to one another is highly valued. Using language and other kinds of communication is the means by which members of the community are included, resolve issues, solve problems, and explore new ideas. Working cooperatively on projects that are based on the interest of the members of the class, establishes connections among individuals, as each member builds new learning. A well-designed Step by Step classroom operates on the assumptions that everyone has a need to belong to a community and has a need to feel useful to others. These classes depend on the members to contribute in academic, social, and practical ways. Children become responsible contributing members of the classroom community because they are needed, depended on and genuinely valued for the contributions they make. Because teachers allow ample time for children to express themselves, to get to know each other, and to appreciate their various strengths and talents in many areas, each person feels valued as an individual.

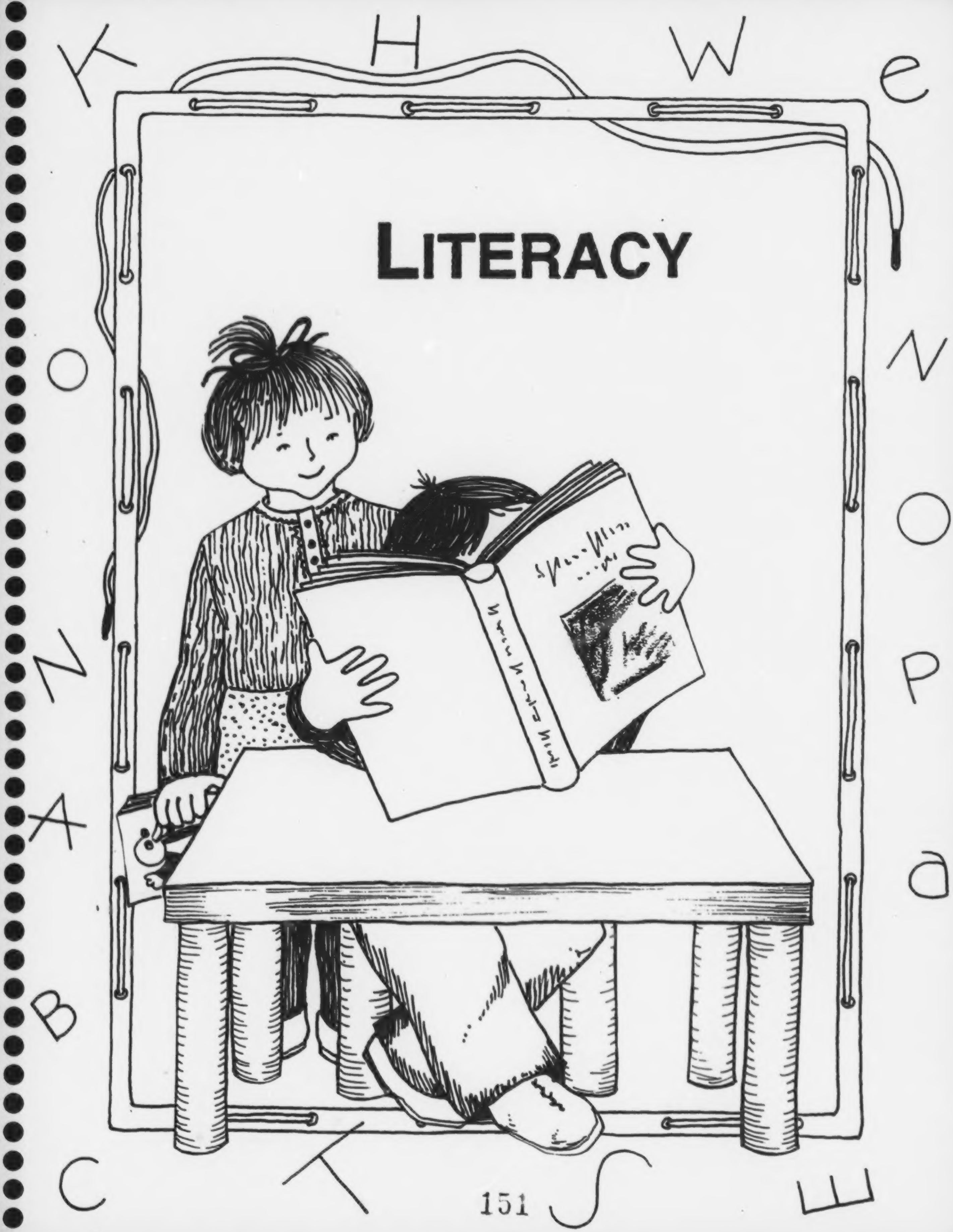
Time and attention in daily routines, through simple actions, and in joyful celebrations nurture the building of community. When a group of people, young or old, work and play together, they build a community. Some simple classroom practices that build communities:

- Sharing materials for a project.
- Greeting each person by name.
- Including another child in a game.
- Holding a sharp remark.
- Making a card to show sadness for someone's loss.
- Celebrating achievements of individuals in the group such as the birth of a new baby brother, or the creation of a new invention.
- Making room to allow another to sit with the group.

These are a small sampling of the many ways that responsive teachers who model caring behaviors and their students can create the feeling of community in the classroom.

Caring, communication, connections, and a community of learners provide a strong base on which children can build knowledge in the Step by Step Primary Program.

LITERACY



IX. LITERACY

You don't get kids to read and write. The quality of top teachers has always been one of invitation...There is a whole world out there to explore; come on in. But you can't invite them to go where you haven't been.

Donald Graves

Overview

The Step by Step Primary Program is designed to create life-long readers, writers, and lovers of literature. Children should see this attitude modeled at home and at school. In the Step by Step Primary Program, reading is considered an enjoyable pastime. Reading, writing, and the command of language are interrelated competencies. The Step by Step Primary Program incorporates the natural development of these skills. It is essential that teachers join in the learning process as partners.

Traditionally, the first year of school is when children begin to work and seriously start the process that their parents, grandparents, and teachers remember doing themselves, namely learning to read, write, and do arithmetic. In many countries, teachers are presented with a syllabus they must cover. This syllabus sets clear expectations about what to teach within a certain period, dictates when to introduce skills, and specifies when and how to evaluate children.

Children learn to speak by a process which is in contrast with the learning model used in the traditional program described above. Acquiring language is a natural process that involves children and their families from birth. Reading and writing are socially transmitted skills which are built on this natural-learning model. Brian Cambourne, a psychologist and educator, has defined conditions for natural language learning based on his observations and reflections on the natural and universal aspects of how human beings learn to speak. These seven conditions are:

> *Immersion*. From the moment a child is born, meaningful, purposeful, "whole" spoken language washes over and surrounds a child. Children are immersed in a "language flood" for most of their waking time.
>
> *Demonstration*. In the process of learning to talk, children receive thousands and thousands of demonstrations (models or examples) of the spoken form of the language being used in functional and meaningful ways.

Expectation. All parents expect their children to walk and talk unless an infant is severely impaired. So strong is this expectation that parents subtly communicate this expectation to their children who respond and actually learn to walk and talk.

Responsibility. When learning to talk, children take responsibility for *what* they learn about their language and *when* they learn it. Each child decides which set of conventions to master and by which route he or she will get there; yet all children eventually arrive at the same destination. This is natural learning.

Practice. Plenty of time and opportunity to use spoken language is provided when children are learning to talk.

Approximation. Children just beginning to talk are not expected to display complete adult competence with language. They are instead rewarded not for being accurate but for being "close" in their attempts.

Reaction. Adults and older siblings who teach young children give them very special kinds of responses. The toddler says, "Dat cup." The adult responds, "Yes, that is a cup." The adult acknowledges the child's message (yes) and offers the conventional, expanded form as a model in a non-threatening, meaningful way. Furthermore, the adult recognizes the fact that baby talk and other immature communication attempts will continue until the child decides to change and would not expect the conventional adult form the very next time the phrase is used.

(These conditions are adapted from Brian Cambourne's *Conditions for Natural Learning,* 1984.)

These conditions provide valuable guidelines for teachers who are looking for conscious ways to be effective. They can serve as a checklist for the teacher as she designs her classroom and plans lessons and daily interactions with the children in her class.

Recent studies have helped improve our understanding of the process used when children learn to read and write. We know that becoming literate involves socially transmitted skills. This process of becoming literate is best accomplished in an environment that is rich in printed materials, one that offers numerous opportunities to use and explore language. It is a joy for teachers to be able to use new methodologies for the enhancement of children's learning as well as for their own success as teachers. We have come to view learning literacy skills as pleasurable as well as functional. These skills are not isolated, but rather they are part of a whole picture. Reading, writing, listening, and speaking are all intimately related and are interdependent.

Children do not enter school as blank pages on which teachers write. They come with a wealth of experiences. These experiences are diverse, having been woven from the culture of the home where beliefs, assumptions, attitudes, prejudices, dialects, and behavior vary. Likewise, a child's preschool experience will affect the kind of literacy knowledge a child brings to the primary program. The challenge, Linda Gibson notes, is "to provide appropriate experiences for children who come to school with wide exposure to literacy, as well as for those who lack understanding." In one home, adults may read to the child and have many books; in another, the child may have very limited access to this kind of experience. One child may see a parent read and write regularly in connection with his or her work; another may only see writing limited to lists and notes. Both of these experiences are valuable for children as they look to parents as role models for becoming literate.

Learning to read and write gives children a significant entry to the adult world. Young children are highly motivated to develop literacy skills. Children learn the language they are exposed to. Becoming literate for six- and seven-year-old students means that they are able to unlock the mysteries of the printed word, which leads to an important sense of accomplishment. Children are more connected with the adult world as their reading skills develop, as significant learning occurs, and as they become more independent within the world of literature. Oral expression and listening activities focus on children learning to use words meaningfully to become effective communicators. Important writing skills are developed when children realize the power and permanence of putting their thoughts on paper.

General Goals for Literacy

The basic aim for literacy in the Step by Step Primary Program is to develop reading and writing as enjoyable activities. Six- and seven-year-old children will begin to see themselves as capable communicators by developing skill-based competence in speaking, reading, and writing.

A child's teacher fosters the enjoyment of reading, writing, and speaking by promoting:

- A relaxed and accepting classroom atmosphere.
- A love of words, stories, and poetry by providing a wide variety of books and materials for literacy development.
- Discussions of stories read aloud.
- The creation of group stories.
- The development of speaking and listening skills through discussions.
- Dramatic expression.
- Listening to and giving instructions.
- Ways to stimulate imagination and extend vocabulary.
- Opportunities to write using a variety of formats, the written word, dictation, and drawing.

Speaking and Listening

By six years of age most children have developed the language usage and structure that they will retain for life. Their vocabulary exceeds two thousand words and will continue to increase. The structure of language and the way of speaking is established. Not only is speech and language adult-like, but children at six can speak in proper and logical sequence. They are beginning to demonstrate a sense of humor and can tell original stories.

At the age of six, children realize the pleasure of social interactions. They are developing an interest in making their ideas and thoughts known to others. With this interest comes motivation to be successful in their attempts to communicate. The Step by Step Primary Program recognizes this stage of development and intentionally structures skill-building opportunities.

Specific Goals for Speaking and Listening

Speaking and listening are vehicles for exploring all areas of the curriculum. Children should be encouraged to:

- Communicate appropriately and effectively.
- Speak with confidence.
- Learn conventions, for example, taking their turn in speaking.
- Ask, as well as to answer, questions.
- Assess information critically.

Activities to Promote Goals

The following activities help to develop these speaking and listening goals:

- Role-playing activities (having a dress-up box in the classroom).
- Music and movement, rhymes, songs, poetry.
- Dramatic productions.
- Discussion times (specific periods set aside to ask about weekend news and personal experiences).
- Listening to stories read by the teacher.
- Hearing other children's stories, and reading their own stories.
- Recalling and retelling stories.

- Listening to recorded materials (audio tapes).

- Listening to a visiting speaker.

- Playing games.

Learning Outcomes

The following are learning outcomes that correspond with the suggested activities listed above:

- Appreciating others' point of view and needs
- Acquiring a sense of rhythm in language
- Learning to modulate one's voice in response to specific situations
- Developing vocabulary
- Contributing information in discussions
- Sharing personal experiences
- Expressing ideas with confidence
- Predicting outcomes and making observations
- Developing an appreciation of literature
- Expanding vocabulary and language structure
- Refining auditory discrimination skills
- Asking and responding to questions
- Evaluating information
- Understanding and responding to multi-step directions

Reading

The Step by Step Primary Program strives to help children achieve their full potential. To this end, developing fluent readers who read for both pleasure and information is the basic aim of the reading program for six- and seven-year olds. Just as babies learn to talk by "talking" as best they can, so young children learn to read by "reading". These early attempts are supported by a caring teacher who accepts their efforts and reads to them daily, one who creates a classroom rich in printed materials and full of opportunities for reading and writing. When children are immersed in reading and writing, they realize how connected these two content areas are. Over time, they come to see that through reading they can be better writers.

It has been said that we read to learn and we write to think. Therefore, an emphasis is placed on thinking—thinking through ideas and how they affect the individual personally as well as how they affect others. In order to emphasize thinking, teachers should expose children to:

A wide range of stories, plays, and poetry. This should include whole-group, small-group, and individual-reading experiences. The range of stories can include, but should not be limited to:

- Retelling well-known and traditional fairy and folk tales from the child's own culture.
- Presenting fairy and folk tales from other cultures and traditions.
- Hearing works that stimulate the imagination and that deal with emotions (such as the death of a pet).
- Presenting stories by appropriate, well-known authors.

Situations that allow them to read for information. They include:

- Opportunities for research of social study topics.
- Gathering information by developing library skills.
- A selection of books and magazines which instruct children how to perform a particular task (for example, how to make a kite or build a bird feeder).

Meaningful and appropriate language, both oral and written. Teachers can foster this by:

- Presenting imaginative and appropriate material for the child's age and experience.
- Introducing rhymes and stories with rhythms.
- Arranging for the children to listen to stories and plays with interesting characters.

- Displaying visually stimulating illustrations to enhance children's interest in different subjects.
- Letting the class hear stories of cultural relevance to particular children.
- Presenting historical accounts from a particular point of view (for example, a parent or grandparent who has experienced a particular event in history could come to school and talk about it).

When the teacher introduces a new story, poem, or language experience, she should remember some strategies whether she is leading a whole group, working with a small group, or dealing with an individual.

Ask questions about the characters in the book. (Who is the story about?)

Solicit children's opinions. (What do you think might happen next?)

Ask children to retell the story in their own words.

Ask children to draw the story in a certain number of pictures.

Make opportunities to reread favorite stories.

Provide opportunities to learn poems by heart.

Give children a chance to suggest alternative endings to stories.

An Overview of Reading Methods

Reading can be taught several different ways, depending on the learning styles and needs of the children.

The Phonic method has been in use since 1890. This method addresses the relationship between sounds and letters and has a special place in the teaching of reading where the language being taught is written phonetically. It is important to take a close look at the material children are exposed to because phonically based texts can be very controlled, resulting in meaningless, stilted language that is remote from children's real language experiences. It is a danger that fluent decoding becomes the only aim, rather than reading for comprehension and enjoyment.

The look-say method has been in use since 1930. This method involves memorizing vocabulary by sight. Once children have a "bank" of 20 or so memorized words, they can use this knowledge to be introduced to reading books. The problem here is that words are learned in isolation and the text is rather truncated, with characters doing uninteresting activities because the vocabulary is so limited.

Basal readers became popular in the 1960s and 1970s and are books written with controlled vocabularies. Book 1 precedes Book 2, with new words introduced in the latter. Texts become progressively more complex and interesting. When working with basal readers, it is advisable to have many small books rather than one big book, as children love to feel the excitement of getting a new book. Basal readers tend to be either phonic or look-say based.

The sentence-making method is where children have boards on which they display words. From a collection of word cards, they can put them in order and make sentences. This system is likely to be less useful for highly inflected languages.

The linguistic approach appeared in the 1950s and is concerned with regular patterns of spelling/sound correspondence (bat, cat, sat). A potential problem here is that meaningless texts can result.

The guided reading lesson is one where all children have the same text. The teacher asks questions and solicits personal observations.

The whole-language approach has been recently introduced and is currently widely used in the West. In this method, children learn to read through exposure to stories, songs, and rhymes which are displayed in the classroom. Texts are carefully constructed to be child-appropriate and meaningful. They are enlarged into Big Books, which whole groups of children can see, and the teacher uses a pointer and reads while the children read along. Often small books with the same text are available. Phonics lessons are given as mini lessons in response to specific needs. The whole-language approach emphasizes:

- Content and meaning
- The integration of reading and writing
- Guiding children to become independent readers

The use of children's own language and composition is interwoven with this approach as part of learning to read. This process helps reinforce the importance of relating oral language to written language. Children are asked what they want to write. Teachers write the words, often under the child's illustration, and the child then reads back the words. The starting point can be varied (a child's own story about a week-end or a child retelling a story the teacher has read).

The Cloze procedure is a process of filling gaps in a text. It is a problem-solving strategy, one that requires children to evaluate and understand what they are "reading."

So the little __________ _________ put on his _______.

Here the child who has already read that "The little old man put on his hat." can fill in the gaps. Or the words "old," "man," and "hat" are put in a box and the child must put them in the right places.

A holistic approach supports the philosophy of the Step by Step Primary Program. The best learning occurs when the individual child's needs are met in a warm and positive environment. The teacher's knowledge of the children's strengths and weaknesses will help her individualize reading instruction.

The Step by Step literacy program aims to individualize teaching as much as possible. The teacher needs to arrange and plan the class in a way that creates the maximum opportunities for individualization. It is important to remember that teaching practices must be adapted to the children's developmental levels. In the early stages of reading, class work guided by the teacher creates a bridge from pre-reading skills to independent reading. Using small-group structures, the teacher guides students to talk, think, and question their way through a book. Children are invited to discuss the meaning of a story. Through their comments, the teacher is able to understand the reading strategies that each child is using. As she listens to the children, she keeps in mind the goals of creating independent readers who read for meaning and enjoyment.

Here is a suggested format for presenting a new story:

Introduce the book by pointing out the front and back of the book, showing the title and title page, the top and bottom of a page, the starting point for reading, and the direction of print. This can be presented as a guessing game, emphasizing how much the children already know about books.

Present the story by taking a "picture walk" through the book. This simply means showing each picture and talking about it, highlighting key concepts, introducing language, and evaluating the children's knowledge about the subject.

Read the story aloud to the children, modeling the language pattern in the story and using expression in your voice to illustrate punctuation. A second reading can then done by the whole group. This step encourages independence while supporting the emergent reader.

Discuss the story. Ask the children to share how they feel about the story and what ideas they get from it. It is important to make connections between the story and the students' lives.

Present a mini-language lesson, focusing on a reading concept (for example, the idea that print contains meaning or that pictures help tell a story). You can highlight easily recognizable words.

Allow time for students to practice reading the story either to another child or to an adult. Encourage independent reading during the time in the school day when children have a choice of activities.

As a starting point, the teacher presents this lesson in a large or small group. After this, there should be one or two follow-up activities. For example, on the first day the class will have a story presented as described above. An enlarged form of a story—or Big Book—is used with the whole group. For example a book called *Brown Bear, Brown Bear*, by Bill Martin is easily adaptable, but many traditional stories can be used. The teacher has written the text on chart paper and displayed it on an easel. The book begins with the text, "Brown bear, brown bear, what do you see?" on the first page. On the next page, it continues, "I see a red bird looking at me." The next page reads, "Red bird, red bird, what do you see?" In this way, the book both has a predictable pattern and exposes the children to color words. Using a pointer, the teacher reads to and with the children. The book should be available to reread for fun.

Possible follow-up activities to a story such as this one could include:

- Making a collage of the animals in the book, using fluffy material for the bear and feathers for the bird; the colors should be bold. Children could work in groups of twos and threes on their animals.

- A color chart should be displayed in the room, showing the various colors and the words for them.

- In math, a graph indicating children's "favorite color" could be produced and children can fill in a square that matches their choice.

Children should become familiar with the easy-rhyming text and will then have no problem following books with a similar format or pattern. Some words may be blanked out and substitutes found (e.g., *Pink* bear, *pink* bear, what do you *smell*?).

While children are involved in activities they have chosen, individual ones can be called over to the teacher to work on any one of a variety of reading approaches, such as: (1) they can read their own individual reading book (basal reader approach); (2) they can practice reading back yesterday's sentences written under a picture (whole-language approach); (3) they can review the color words written on flash-cards: Find red, yellow, etc. (look-say approach); (4) they can look for all the words beginning with a "b", and then write them down (phonic approach).

The activity chosen by the teacher for a particular child depends on where the child is in his or her own development. A record sheet or checkbook for data and comments is a quick way of seeing the progress of each child. It also is a mechanism for teachers to keep a record of which children have had a turn to work with her each day.

Over time, a different version of the same basic text that the teacher originally presented will emerge. Some children can go away and write their own version of the story, some children can have books prepared by the teacher (using a photocopier, if one is available) with the original text, but lacking illustrations, which the children then draw. While these two levels of activity are going on independently, the teacher can again use time to ask individual children to read with her.

Reading individually can be very effective because the child has a moment alone with the adult and a special relationship can be fostered to give the child confidence in what he or she has achieved. In addition, it allows the teacher to monitor progress and find and fill gaps in the child's knowledge. A good time to hear a child read individually can be in the morning during the period when children have a chance to make free choices about what they do. When they are finished, they can return to their block-building, puzzle-making, or other activities. With a reading checkbook set up, children can be called to read throughout the day.

The Changing Roles of the Reading Teacher

In the Step by Step Primary Program, the role of the teacher as reading instructor is complex and diverse. In addition to being instructors, teachers are also guides, learners, facilitators, and designers. They are alert and involved in small groups, large groups, and individual situations.

Teachers should expect and strive to understand the different rates of children's learning and become comfortable with their different levels of competence.

Research has shown that punishments and fear are impediments to learning. Likewise, when children are ignored or bored it reduces their motivation. Informed teachers allow a degree of thoughtful silence. They must give children time for "mental room" (Marie Clay) and not expect them to answer too quickly. By not interrupting and waiting longer, teachers encourage children to continue on their own.

As Susan Kontos points out, "Before children can become readers, they must learn why people read and what people do when they read." Primary program teachers pose open-ended questions which can have a number of possible answers. This way, a positive, accepting atmosphere can prevail. Statements like "good work" or "I can see you tried very hard on this," or "fine" can be heard as the students work.

Writing

It is natural for children to use their own individual ways of communicating when they write. Some children will draw before they write, others want to see the words first, and still others are able to create elaborate dramas using blocks or other manipulative materials. Some children want to tell their story before drawing or writing anything. It is most important to recognize and capture the boundless expression available in a child's natural way of communicating and use it as a bridge to writing. Children need experiences that use various approaches to language (such as drama, music, art, literature, and discussions) in combination with writing.

The writing goals of the primary program are designed to give children the opportunity to write about topics of their own choosing and to make sure they have the time they need to write and let their ideas evolve. Approaching writing in an individualistic and creative way fosters:

- An appreciation of writing as a means of communication.
- The love of writing and the capacity to see it as a source of enjoyment.
- An understanding of the connection between speech and writing.
- The ability to organize writing so that it is clear to the author and to the reader.
- The opportunity to expose children to different kinds of writing (stories, diaries, lists, captions, observations, invitations, instructions, poems, and letters).

An Overview of Writing Methods

Traditionally, writing in the primary program meant learning the mechanics of writing, especially penmanship. Spelling and grammar and, later, comprehension exercises in connection with reading were also part of writing and reading.

The contents of writing programs have changed radically, and so have the methods. Writing now is primarily a way for children to communicate and express their ideas, thoughts, and emotions. Writing is done in a social context and in an atmosphere of encouragement. This encouragement comes from both peers and adults.

Traditionally, a child would write about a specific topic assigned by the teacher and read by the teacher. In the new method, children write as writers and authors do. They write for a audience about a personal interest that is self-selected.

It is vital to keep in mind the following characteristics of the "process approach" to creative writing:

- The child chooses what to write about.
- A piece of writing evolves over time.
- Content is more important than grammar and spelling.

Steps in the Writing Process

Choosing a Topic

The teacher may hold a class brainstorming session during which children can invent topics they want to write about. These topics can be put on a list and kept in the children's individual writing folders or they can be posted on paper in the room. This list can (and should be) added to and changed. The children may be interested in writing a follow-up to a story read in class. Stories can be created around a magazine picture, a photograph, a classroom activity, an object, a discussion, or an experience that a child has had or anticipates having.

It is important to note that children sometimes make choices which excite them at the beginning of the week, but they may lose interest in what they are writing as they explore it more fully. A decision to conclude the writing or to continue it can be made jointly with the teacher. It is difficult to write when you don't like the topic.

Drafting

The idea of doing a draft of a written piece differs from the traditional idea that children write a story in its final version in one period of time. Using the various stages in the writing process as a teaching method changes the focus of learning and can motivate children differently. Drafting allows for a leisurely pace. A piece of writing evolves over time and children can be encouraged along the way.

At the beginning of the school year, six- and seven-year olds may spell using only initial consonant sounds. Then children will add final sounds and other sounds they hear. Research shows that although children may not spell correctly, the sounds they write will be logical. It is important for the teacher to note that if correct spelling is emphasized at this point, it will dominate the content.

A child might choose to write about a birthday, draw pictures, and then label them (Page 1: My Cake. Page 2: My Presents. Page 3: The Candles). Or a child may write a story entitled, "My Weekend with Grandma." These stories can develop over a period of time and be improved and changed as the child's ideas evolve. All children can produce, and having done so, they have become authors.

Revising or Rewriting

This is a stage that most children will reach as the year progresses. Not every piece of work has to go through a serious rewrite. Beginners revise by adding more details or by taking out repetition. Revising or rewriting is especially helpful for those children who need to be challenged; children who are ready to extend their writing can be asked to expand descriptions (Calkins, 1986).

The decision to revise, rewrite, or consider the writing complete can be made in a conference with the teacher. The teacher can use conference time with the child to extend, challenge, and teach on an individual basis. Children learn about how to do a conference by using the model provided by the teacher.

The purpose of conferencing is to provide constructive information that helps writers clarify their writing. Children also can conference with each other; this is called "peer conferencing." Children should be taught how to do this. A set of rules for conferencing can be collectively generated by the class. For example:

- The author sits in a chair and reads the piece of writing to the group.
- The listeners sit on the floor, listening attentively to the author.
- The listeners can ask three questions.
- During conference time, questions should be posed, rather than judgments given.

Editing

Editing is the process of looking at the written text for completeness. This process is not for every piece of work, especially for six-year olds. During the editing process, attention is given to spelling, punctuation, and grammar using specific guidelines provided by the teacher.

At the point in the writing process when the teacher and child consider the work complete, the text is placed in a special box for finished pieces ready to be "published."

The Changing Roles of the Writing Teacher

The classroom teacher takes on many roles during the course of the day. She is responsible for teaching many different children and offering them many different ways to succeed. As teachers of writing for communication skills, teachers in the Step by Step Primary Program model are expected to be active participants in the learning process, demonstrating the uses of writing (and reading) in the classroom. The teacher helps children make connections between reading and writing and everyday life by demonstrating the practical aspects of print.

The teacher becomes an architect of space and time by designing clear structures and procedures for the children. In this way, she organizes a free, independent environment where the children know what is expected of them. She creates this exciting, stimulating environment by providing a wide variety of books, words, poems, newspapers, and materials. She listens and responds to the children in a genuine way.

The teacher acts as a guide who gives children the opportunity to plan, review, assemble, and share their ideas on paper. She gives them chances to collaborate, to read their work aloud, and to discuss what they wrote with peers as well as with herself. She encourages children's confidence in themselves by accepting each one's developmental levels. She teaches them by posing questions to help them make choices about organization and content. She works to continually find ways to move children to the next level of their intellectual development by extending both their knowledge and their confidence.

Organizing a Classroom Ready for Literacy

A logical way to promote reading and writing is to have many printed materials in the classroom that can be read and responded to in writing. Children will appreciate the functional aspect of print when they are given information through signs, labels, and written instructions.

The classroom should be organized as a place where children can write and read easily. The environment should be designed to accommodate children's different learning styles and stages of development. There should be large-group meeting space; small quiet areas which individuals can use during reading times; places for art, science, and writing activities; and centers for blocks and math manipulative work. Paper and pencils (or other writing instruments) should be available in each activity center to promote spontaneous writing. Signs, labels, and class-dictated stories should be displayed as well as the work of individual children.

The following are some suggestions for organizing the classroom for reading:

Label areas of the room: Library Corner, Science Table, Block-Building Area. Pictures of the content of the particular areas should be alongside the labels in order to help nonreaders by providing visual clues as to what the words mean.

Label specific objects throughout the classroom: door, window, desk.

Post instructions which list succinct steps for carrying out a particular task. For example, if the class has a pet or animal, a list may be hung by the animal's cage with written instructions such as "How to Care for Our Class Pet":

Empty out old food.

Check the water.

On Monday, Wednesday, and Friday, change the straw. Put the old straw in the trash can.

Person responsible today: PAM.

Carry out other simple tasks in this same way. Instructions for a craft activity could be posted once a week. Written and pictorial instructions can be made to illustrate the steps involved.

Display the alphabet (upper and lower case) around the room. Or small strips of paper showing the alphabet can be taped to each desk top. This fits with the developmental level of six- and seven-year olds who tend to be visually myopic and have difficulty copying from a distance.

Show the days of the week, months of the year, and a birthday calendar of children in the class.

Select and display a poem of the week. Provide children with cards or paper and pens near this display; post a sign which challenges the students to add some lines to the poem, to make a new ending, or to write their own poem.

Develop a challenge of the week. Write and post a challenge in the block corner or the math area. For example, "How high can you build a block tower before it falls over? How many blocks were used?" Hang a blank paper on which children can record their responses; this is a good way to encourage writing, mathematical thinking (by making comparisons), and data gathering. At the end of the week, the class can assess the data and make a graph or chart to illustrate the findings.

Write and post instructions for any classroom procedure. Change them regularly. This keeps children attentive to their visual, "print" environment.

The possibilities for exposing children to meaningful texts are many and should be varied. As children thrive on richness and diversity in the classroom, teaching becomes more enjoyable.

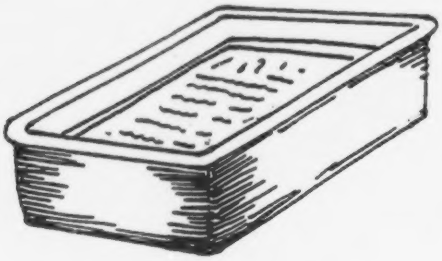
Writing in an Organized Classroom

In order for children to begin to see themselves as authors or writers, certain conditions must exist. The teacher must demonstrate a belief in the value of individual expression; this is done by creating an open, accepting atmosphere in the classroom which encourages children to offer suggestions, add their opinions and ideas, and make contributions in creative ways. The teacher must make a commitment to the development of each individual "voice" as that individual discovers the pleasure and power of the written word. Offering choice within a structured plan for writing opportunities helps to establish a groundwork for self-expression.

Children learn to take responsibility for their education. When children are motivated to pursue an idea, the teacher must help them organize their work, learn where they can find supporting materials, get questions answered, and feel encouraged to complete their work. It is the teacher's job to structure the environment so that procedures for getting materials and for obtaining information are clear. These procedures should encourage independence on the part of the children; they should not be teacher-dependent. Children should have ready access to:

- Their own individual writing folders in which on-going writing pieces are kept. These folders should be personalized, labeled, and available to the children at all times.
- Paper of all shapes, sizes, textures, both lined and unlined.
- Glue, scissors, staplers, rulers.
- Pencils, pens, crayons, and markers.

- Blank books, which can be made by the children as an activity or by parents and supplied to the classroom on a regular basis.
- A box or container for completed work which the teacher reviews, responds to, and can make suggestions for improvement.



Creating a Writing Workshop

"Writing workshop" is scheduled at least three times a week and is characterized by six unique components. During writing workshop, children are encouraged to take responsibility for and control of their writing. They bring all their experiences and their knowledge of a chosen topic to the writing process. A writing workshop helps them structure the writing process when the following elements are implemented:

The mini-lesson. This is a presentation of approximately 10 minutes by the teacher on an aspect of writing, such as: Where do authors get their story ideas? What makes a good story? How do you make a character seem real? A workshop could also be organized on the mechanics of writing or on the structure of language.

Writing time. Children now write quietly and for a sustained period of time. Teachers should encourage children to write about something that interests them or that happened to them. Early in the year, many six-year olds will draw pictures and attempt only a few words, if any. These attempts should be accepted and encouraged. When children see that their efforts are accepted, they will increase their efforts.

Conferences. These are one-on-one conversations between the teacher and a student to discuss a specific piece of writing. The teacher makes suggestions and helps the child clarify his or her work.

Sharing. Usually at the end of writing workshop, the class will gather for a group sharing time. A completed piece of writing can be read. A child may ask for help from other children with a particularly difficult aspect of their work. For example, a child may ask, "Can someone suggest a more interesting opening sentence?"

Revising. This step is added later in the year when children have mastered basic writing skills. The amount of rewriting to expect at this age varies with the maturity and motivation of the child. The teachers' ability to individualize her expectations and the curriculum is important at this stage. The child's opinion and level of satisfaction should also be taken into account.

Publishing. Writing pieces can be "published" in a variety of ways. Sometimes work is typed at the editing stage. Sometimes the child rewrites the work. One method of working with typed text is to give the child a blank book; the child then decides which words or sentences are wanted on Page 1, cuts them out, glues them in, and illustrates the page. When the book is published this way, it can be put in the Library Corner for others to read. It can even be checked out and taken home like a regular library book.

A complete text should have:

The author's name
The pages numbered
A title
The date

It is fun and psychologically beneficial for children to add a page about the "author." A passport-size photograph can be glued in the book. The children write some personal facts such as where and when they were born, what they want to do when they grow up, their interests, other books they have written. This simple addition builds self-esteem, helps children get to know each other and develops mutual respect.

Evaluation

Evaluation in a classroom which uses a holistic approach to teaching literacy takes place every day, throughout the day. This evaluation informs the teacher as she assesses the needs of each child.

Evaluation occurs within the context of activities. The key to becoming an effective evaluator is becoming a sensitive, knowledgeable observer of children. The teacher, as a good observer, compares what a child is doing to what she (as a teacher) knows about developmental levels, about learning styles, and about teaching strategies. The teacher then modifies her instructional practices to meet each child's needs.

Summary

The Step by Step program for developing literacy skills has unique characteristics. It recognizes the family and parents as the first teachers in the child's developing language skills. It immerses children in a print-rich environment. Children are offered choices for involvement in natural opportunities for using language. Various ways of "playing with" the sound of language in poems, songs, stories, and word-play games are presented. Informal activities take place which show how books are developed and printed. Teachers encourage original responses and creative expressions from the children, always mindful of each child's stage in development.

The Step by Step Primary Program helps children realize the value of being literate as a way of becoming active participants in democratic communities.

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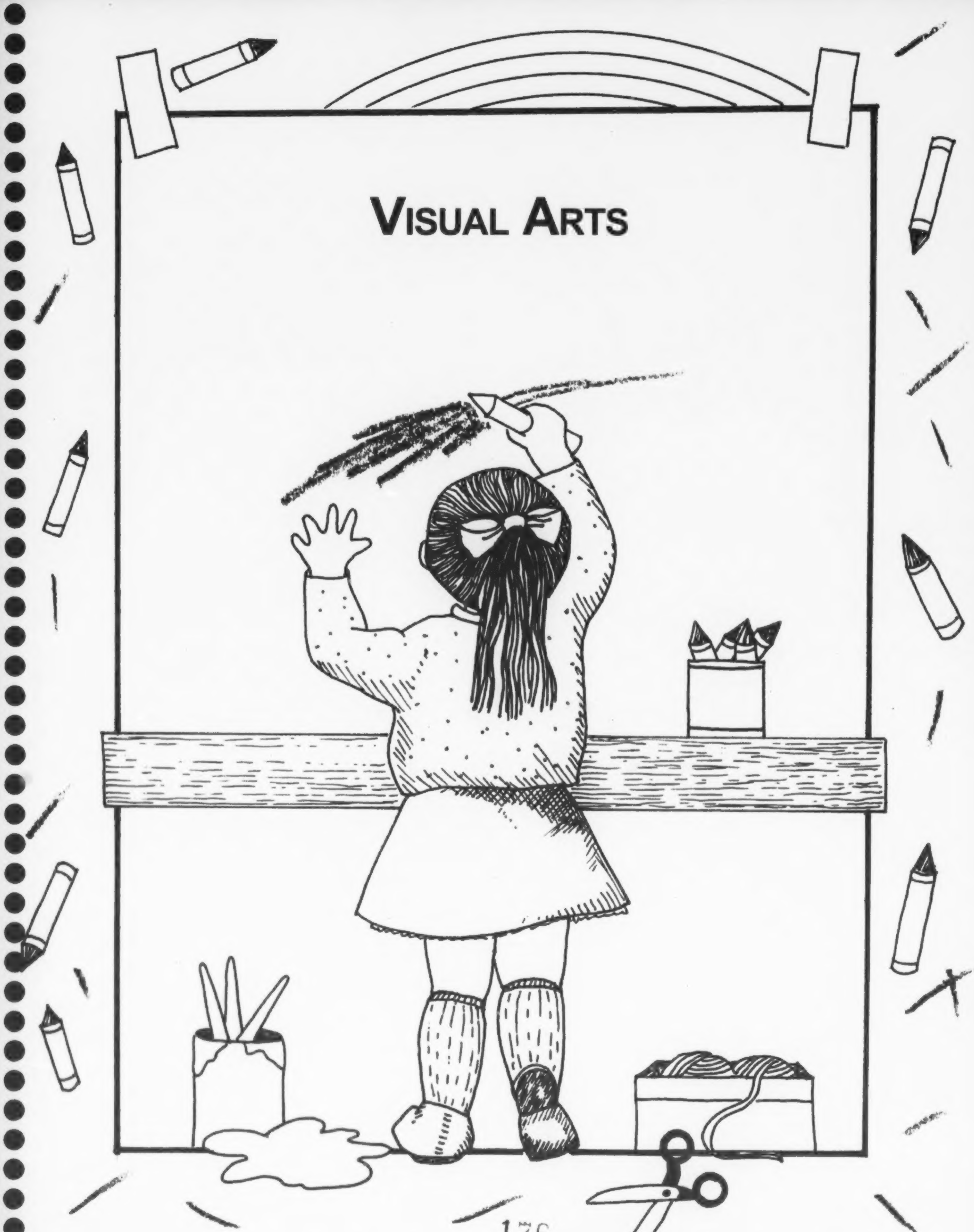
VISUAL ARTS



X. VISUAL ARTS

Whatever we look at with delight, whatever we see that gives us pleasure, though we may think we have forgotten it the next day, will influence us all our lives.

George Santayana

Overview: The Value of the Art Experience

Over the centuries, art has played an important role in every civilization and culture. Anthropologists study a society or culture through its art. Artistic works that have been preserved are a key to understanding the beliefs, customs, history, and creativity of a people.

Today, art refers to the conscious efforts human beings make to arrange lines, colors, shapes, sounds, movements, and other sensory phenomena to express feelings and ideas. What is created now will be studied by future anthropologists.

Children have their own special "culture." Partly because their literacy is not yet highly developed, they naturally choose to use other modes of expression. Art is a natural language for them. Art experiences allow children to make contact with their imaginations through hands-on activities. Deep understanding and knowledge comes through the hands as well as through the mind. Exposure to a wide variety of art mediums lets children see the broad array of experiences they can have in art.

Creativity can be viewed as the process of combining new elements with past experiences to produce a fresh idea or concept. At the core of artistic creation is innovation: the ability to go beyond perceived boundaries and rules. Any truly creative idea originates in the imagination. There is a saying that "Reason can answer the questions, but imagination has to ask them."

Through divergent thinking—thinking that produces new answers and solutions—children have quality art experiences. In solving artistic problems they learn that there is "no single right answer." For example, most children know that there are three primary colors. They discover that by mixing and re-mixing these colors they can produce new, exciting color combinations. Divergent thinking has made this possible through fact gathering.

It is important to remember that the creative impulse is a companion to the discovery drive in every individual. Nurturing and channeling this creative vitality in children should be a primary goal of teachers and parents.

Quality art experiences have great value in every child's education. These experiences challenge the originality within each individual child. They promote a creative attitude that offers a positive route to individual growth and development within an elementary school program. This attitude can carry over into other aspects of children's lives, enriching their future as well as their interaction with others.

Adults and young people benefit from children's experience with art. Quality art experiences give children the chance to observe, learn, and create using a wide variety of mediums. These art experiences:

- Help young people observe carefully and record their perceptions and feelings.
- Give children the chance to organize and express visual ideas.
- Encourage imaginative thinking and risk taking.
- Give children another language for self-expression.
- Teach creative problem solving through trial-and-error methods.
- Build self-confidence and self-understanding.
- Foster responsible and purposeful work habits.
- Help children develop small and large motor skills.
- Give young people the chance to make aesthetic discoveries and judgments.
- Enable children to observe many ways of looking at their world.
- Foster a respect for the creative ideas of others.
- Provide pleasure that can extend over the course of a lifetime.

The Artistic Development of Six- and Seven-Year Olds

Children's art collected from almost every part of the world reveals that, no matter where they live, children start drawing at about the same age. Just as experts on language patterns have observed that the first sound babies make are similar the world over, the first scribbles that children make are equally similar. Rhoda Kellogg, an American educator, has collected children's art from all over the world and has discovered that young children everywhere draw the same things in much the same way at the same age. Her research and enormous collection have been helpful in understanding children's artistic development.

Six- and seven-year-old children often repeat a formula representation of a familiar object; they draw trees shaped like lollipops. They are organizing the world around them, trying to give logic to its arrangement. Often a house has a gabled roof and the people they draw are usually too big to fit through the door. Possibly these people are more important than the house. Using symbols as images is a mark of creative thought.

The six-year-old artist:

- Works carefully at controlling eye-and-hand movements and makes a strong effort to stay within lines when that seems necessary.
- Draws what he or she knows, not what is seen.
- Creates symbols to express certain ideas and feelings.
- Uses colors expressively. The relationships between colors and objects often are not established.
- Divides space on paper into ground, air, and sky. Suns often appear in the corner.
- Enjoys constructing buildings and playing with them afterwards.
- Gets pleasure out of using a wide variety of art materials.

The seven-year-old artist:

- Is interested in making or drawing objects more realistically; color and object relationships are now better established.

- Draws with greater care. Images are smaller and careful thought is given to details that will enhance the picture.

- Enjoys constructing dioramas and inventing machines.

- Continues to divide space on paper into ground, air, and sky, but does this with more care.

- Places figures along a line or at the lower edge of the paper.

- Sometimes uses a three-fingered grasp on the pencil in order to gain more hand control.

Six- and seven-year olds may share artistic characteristics. This does not mean that they work at the same pace. Some children of both ages work quickly with great spontaneity. Others work at a slower pace and may need extended time to complete their work. Individual learning styles play a strong role in how each child works and creates.

In every classroom, there will be children who do not fit into standard developmental categories; these are children with special needs who may have difficulty using art tools. They may be developmentally delayed or emotionally troubled. Sometimes these children display significant artistic talent while at the same time having great difficulty learning how to read.

For some children, art experiences can be therapeutic. Art gives them an outlet for their excess energy. Making constructions of wood, building high towers with blocks, or just getting their hands into clay can help children channel energy.

It is important to acknowledge children's similar artistic characteristics as well as their differences. Sympathetic responsiveness from a teacher, as well as constructive learning experiences within the classroom, can make a positive difference in how children feel about themselves.

An Art Program for Six-and Seven-Year Olds

Motivation

The teacher sets the tone and atmosphere for a creative art experience. Creative learning happens when creative teaching takes place.

In teaching art to young children, it is important to find a balance between over-directing them and allowing them to do anything they choose. Finding this balance point is an important part of planning every art lesson. If the teacher is telling the class how to perform every step and displays a copy of what she expects the children to complete, then over-directing has taken place. These children will not have the opportunity to do creative problem solving for themselves. Every successful art process allows for open-ended solutions and individual problem solving.

The teacher should have learning goals or objectives in mind. The teacher needs to be as inspired as the children as enthusiasm is very contagious. It is important that the children feel eager to get underway in the creative process. The sound level in the classroom should be a busy hum of activity as the work process begins. The creative climate and work conditions must be such that children are encouraged to make new discoveries while feeling free from external evaluations.

Reading stories, looking at art prints, and taking field trips to museums are excellent ways to stimulate children's thinking about art. They need to explore the new ideas gained through their experiences with words and to discuss possible approaches to art activities as a group. Step-by-step demonstration of an art process by the teacher can be very helpful. The visual learner will profit from observing the process before starting to work. The auditory learner will gain from hearing the words used to describe the process. While the teacher is demonstrating an art lesson, it is important that she remind the children that they are learning how to use the art tools only so that they will be free to implement their own creative process. It is during this demonstration time that the teacher incorporates specific art items and vocabulary in her explanations. Children will use precise terminology when it is explained and expected. Vocabulary will grow as children develop a purpose for using new terms.

In presenting an art lesson, it is important to avoid using a pattern. Patterns or outlines create a sameness and uniformity that does not allow children to draw fully from their own ideas, depriving them of individual expression. By allowing children to create their own shapes, the teacher shows her confidence in their artistic abilities. She shows that she believes that they will grow and improve as they build their own images; moreover, she reinforces the importance of their ideas and views.

Patterns or pre-cut shapes can be valuable at special times if a certain shape is complicated or if time is needed for children to focus their creativity on other areas. For example, pre-cutting a book cover and interior page with a paper cutter saves time and makes the assembling process easier for everyone. It is important to give children as much time as possible working on the other aspects of the book. The pattern serves only as a base or structure on which the child can build. At the end of each art process, no two works of art should look alike.

Some children like to look at a form or image that they can copy. There are children who have the talent to do this with surprising accuracy. They are comfortable with this approach and learning style once they have internalized an image, it becomes theirs. Still, the teacher needs to encourage them to make the transition from copying the object to doing it their own way. An example of this would be an animal image found in a book illustration which children who wish to can learn from copying but then should be encouraged to make it on their own by doing it several times. Frequently, six- and seven-year olds draw favorite shapes over and over again until they have mastered that shape or image. On their own, they will spend extended time refining a visual idea until it suits them.

Guidance

When children are actively involved in a creative process, problems sometimes arise that require the teacher's guidance. Suggestions are best offered on an individual-need basis. For example, a child may want help in defining the creative task. Visually organizing ideas can be difficult for some children. When this happens, the teacher can act as a guide in thinking through the problem; she can then help the child identify different approaches and solutions. Using a separate piece of paper to work out the idea can be helpful to the child.

As seven-year-old children begin to develop more mature perceptions of visual images, frustration can set in when they try to execute these more complex ideas. Again, the teacher can help children by talking through the idea and helping them figure out various ways to carry it out.

Often young children do not like their initial efforts and may want to start over again. If this happens, it is best to allow them to do so. Otherwise, they are rarely happy with their end result. Allowing a child to begin again demonstrates respect for that child as a creative individual, and it is more important to validate this individuality than to save a piece of paper. Often the reverse side of the rejected paper can be used or an unwanted section can be cut away.

Recognition and praise from the teacher is important. When children experience frustration, teachers can look for ways to provide positive encouragement. Much of what the children are trying to do is not easy—making a pleasing clay pot or constructing a kite takes time, practice, and patience. When children accomplish their goals and overcome such problems, they have learned that they can persist and succeed.

Teachers, too, learn from trial and error. If too many children require help with a particular art process, then the lesson needs to be redefined and simplified.

The teacher should not be overextended when carrying out projects. Sometimes another pair of adult hands can be helpful. This is when an enthusiastic parent can be of great help. An example of a large project requiring several pairs of hands is when a class makes a collage mural of a city neighborhood. Such a project would involve tacking a large length of paper to a wall. The class would then decide a general layout of the neighborhood. Then construction can begin. Buildings, trees, and transportation shapes do not necessarily have to be one-dimensional—they can extend from the wall. Once the children have decided where to put their contributions, parents can lend a hand in building shapes and placing them on the paper, especially since getting paper collages to adhere to surfaces is not always an easy task.

Evaluation

Talent plays a role in a student's interest and skill in art just as it does in other subject areas. Still, in the early school years it is unwise to identify "the best class artists" or to compare one child with another. Such comparisons discourage those students who enjoy creating art primarily for the pure pleasure of it. Respecting all students' artistic efforts and insights makes young children feel valued and prompts them to take risks and try new things in their learning environment.

When evaluating a child's art, the teacher should always emphasize the effort at this age level. Developmentally, six- and seven-year olds are on different levels and the products they turn out will vary widely. This is why constructive evaluation needs to focus on the energy and ideas that a child puts into any undertaking more than on the product that is made.

Some good questions to ask are:

- Did you enjoy making that?
- Where did you get that wonderful idea?
- Are you happy with your construction?
- Do you think you are finished?
- Tell me about your painting.

One of the goals of the Step by Step art program is to help children evaluate their work. A teacher can model the questions that children might ask themselves when self-evaluating. Adults should avoid making judgmental statements about products. They damage self-confidence and stifle creativity.

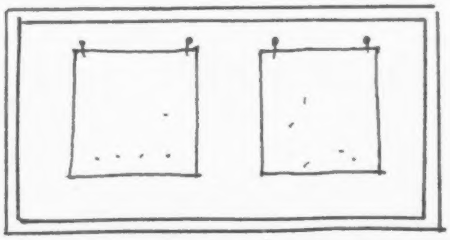
It is important for the teacher to comment on or praise the art work of every child in the class and omit no one. Commend each one for what has been done, not for who she or he is. The child is already fine; it is his or her creative efforts that are being valued. Everyone has a unique idea. Effort should be commended whether the product is successful by adult standards or not.

After the evaluation process has taken place, children's art can be displayed in the classroom or school or it can be taken home. Six- and seven-year olds love to show off their art to visitors, friends, and parents. When art work goes home with the child, teachers should check to see if it's properly rolled (or wrapped if it is a piece of clay). One of the things children are learning is how to handle objects of art so that they arrive safely at their destination.

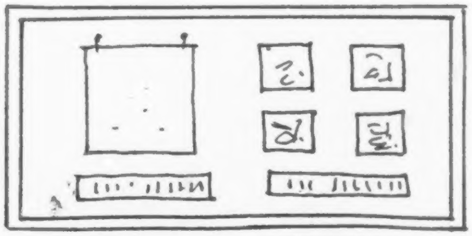
When teachers have conferences with parents, art experiences and successes should be commented on. Parents' knowledge about and involvement with their child's creativity should be encouraged. This reinforces what the teacher is working to accomplish in the classroom.

Art Displays and Exhibits

Children enjoy seeing their work on display—regardless of their age and grade level. They take great pride in showing their artwork to friends, visitors, teachers and parents. Colorful art displays add much to any classroom, reception area, or hallway. Entrance areas into the schools should reflect the learning and creativity that takes place in the classrooms.



Formal Display



Informal Display

It is important that each child have work on display several times throughout the school year. Names should clearly show on children's work. Six- and seven-year olds should be signing their own works of art just like grown-up artists. Early in the year, the teacher may have to write this information for the child on the work. Later on, most children can do this themselves.

Children are motivated by knowing their work will be displayed. Displays can be made up of individual works of art or of group efforts such as a mural. Some hallways or reception areas have display space for three-dimensional work When displays are mounted on the wall, it is essential that they be put at the height of children. Young artists like to be able to see their work close up and to point out what they have created.

An Art Center in the Classroom

The classroom can have an art center or special corner set aside where children have access to art materials on an independent basis. Art prints mounted on the wall of the center can enhance "the specialness" of the space. Art activities can be suggested on a bulletin board in the center, and can be changed weekly. Allowing children the freedom to make choices in the art center encourages them to be inventive and creative. The teacher will show the children how to use the various art tools and supplies before they begin to work with these materials on their own. Two assigned children can check this space daily to make sure that everything is returned and in place. Care and respect for art materials and work space teaches responsibility in a positive way.

The art center can grow gradually. The class does not need many art materials to start out For an art center to be successful, art materials need to be within easy reach of the children. Marking storage bins or containers is helpful; paper scraps can go in one box and fabric in another. No materials should be so special that they are locked up in a closet. The only exception might be materials that are being saved for some project that will be done by the entire class.

If an art easel is available, the floor underneath it can be covered with protective material. Having a place to hang smocks or aprons will make painting experiences less messy.

Using recycled materials in the classroom is important. It teaches children that many materials that might otherwise be discarded can be used in imaginative and creative ways. Scraps of wood or bottle caps, for example, can be used for many purposes. The center should be a "hands-on" working space.

Holiday Celebrations

Holidays are special occasions in the life of every six- and seven-year old. Children look forward to using art materials to make cards, invitations, and presents. Almost every art medium can be used to make gifts and decorations. Each country and town has its own traditions which prompt children's creativity; some help them learn about ways to give to others.

Parent Participation

There are many ways parents can become active and involved in their children's art activities. Often there is a child with a parent who is a craftsman or artist; one parent may be a potter and another a weaver. Artisans usually enjoy being asked to share their knowledge with children. In turn, the children will take pride in sharing their parent's talents.

Parents can also be extremely helpful in collecting materials. Sometimes wonderful extra paper can be gotten from a printing plant. Wood scraps can be retrieved from a neighborhood construction site.

When there are holiday celebrations, parents can help with the planning and the festivities. Extra hands are always an asset during special events. Everyone benefits from the collaboration.

Safe Art Practices

Safety rules are important for children to follow in art. Teachers should make sure that all children understand and work together to implement rules such as:

- Use art tools carefully.
- Put tools and supplies away when they are not in use.
- Keep art materials away from eyes, mouth, and face.
- When paint is spilled on the floor, table or chair, help clean it up. Warn people if the floor is wet.
- After you have finished your art work and have helped clean up, wash your hands.

Art Units

In planning an art program for six- and seven-year-old children, there are several factors that need to be taken into consideration:

- The available art materials
- The size of the classroom space where the art activities will take place
- Water sources and drying space for painting
- Class size—the number of children who will need to work in a particular space

The goal or purpose of the art experience should be defined. Interrelating the art activity with other subject areas is important when planning art lessons.

The four art units outlined below are wide-ranging. Parts of these different units can be combined and explored throughout the school year.

Unit One: Looking at Art

Children are encouraged to examine and observe how the elements of art are combined to create something:

- Different kinds of lines: painted, drawn, sewn, written, or printed
- Shapes and lines: combined in different ways to make a design
- Shapes as forms: animals, faces, trees, flowers
- Shapes and color: collages, paints
- Shapes and textures: sewing, knitting
- Colors: warm and cool colors, color families, mixing colors
- Texture painting: painting with various brushes on different surfaces

Unit Two: Discovering and Expressing Ideas

Children are encouraged to explore and use different art mediums to record and express what they observe in their daily lives.

- Art about people you know: families, friends
- Art about food: still-life drawings
- Art about homes: representing the spaces we live in

- Colorful places: locations seen on trips or nearby
- Changes in seasons: summer, fall, winter, spring
- Animal life: pets, zoo animals (this could be a clay sculpture project)
- Plant life: flowers, vegetation
- Celebrations: national and religious holidays.

Unit Three: Noticing Many Different Kinds of Art

Visiting art studios and museums is a way to discover different kinds of art. Children can then experiment with these mediums.

Pottery: making clay pots, sculptured figures, tiles
Weaving: working with a simple loom
Fabric design: making a fabric quilt
Clothing design: devising hats, handbags, outfits
Masks: learning about and making masks from various cultures
Jewelry: creating pins and necklaces
Mosaic: designing panels for floors and walls
Stained glass: making simple glass designs
Banners or flags: copying national flags or creating banners for special occasions
Folk art: using the art of your region or country as a base for design
Photography and film: taking and developing pictures

Unit Four: Seeing Artists Around Us

Children discover that there are artists all around them who create buildings, crafts, posters, cars, illustrations, airplanes, books, and the desks used every day in the classroom. These artists specialize in:

Lettering
Creating graphics for posters
Illustrating books
Building buildings
Designing interiors of rooms
Working as landscape architects
Planning cities (urban spaces, parks, zoos)
Designing for industry (cars, boats, airplanes, telephones)
Running museums

Teaching Content Areas Through Art

Art is an exciting and creative way to explore content areas such as social studies, literacy, mathematics, and science. Teachers can create art activities to help illustrate concepts taught throughout a thematic unit of study. Art is an effective vehicle for culminating projects in a thematic study as well. As children produce paintings, projects, and murals related to a particular area of study, a teacher can watch for examples of conceptual understanding to assess the child's learning. The teacher looks for examples of the child's grasp of the main idea of a concept. For example, if a class studied about the people and life in the arctics regions and then decided to produce a large class mural showing life in the Arctic, the teacher would look for illustrations showing animals, tools, clothing, artifacts, and habitats common to the region in the children's painting. Information is reinterpreted through art when children are given time and materials for exploration.

Art activities provide a way to experience and unify all content areas presented in a primary program. Teachers who teach from a developmental perspective always include an art experience as a way of individualizing and recognizing the visual and kinetic- or tactical-learner.

Experiences from nature and the out of doors, while promoting scientific investigations, can also help children acquire an aesthetic appreciation of the environment. In literacy, often a story or poem written by a child does not communicate the idea to the young author's satisfaction until it is illustrated.

Playing music in the classroom helps to establish a climate for creativity. Music is inspirational for young artists. They can respond through a variety of art mediums to tempo, rhythm, and beat to express music through their artistic efforts.

Mathematical concepts of numeration, order, sequence, and patterns can be clearly exemplified through art activities. Children can use their mathematical and logical abilities to make dice, games of chance and logic, and pictures that represent word problems.

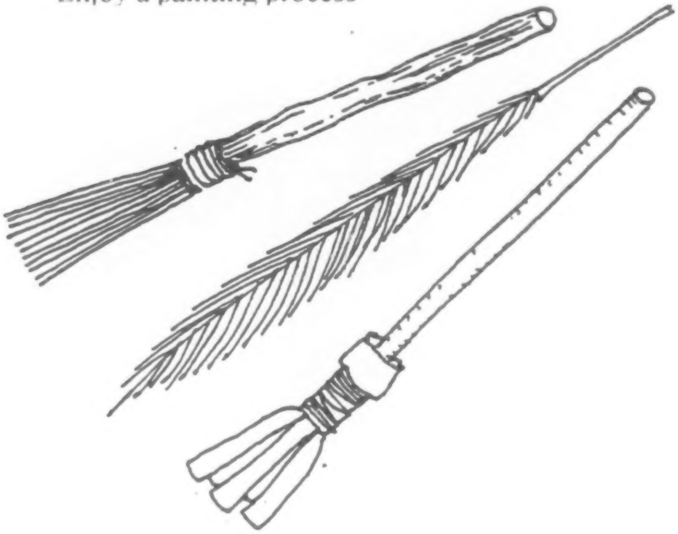
Through art, ideas that come from all parts of the world can be explored, extended, and assessed. A teacher can demonstrate flexibility of thinking and creativity as she prepares ways to integrate content areas through art.

Sample Lesson Plan: Inventing a Better Brush

Objectives

Through this activity students will:

- Look around in their environment and discover that they can make their own art equipment and tools
- Discover what different effects can be achieved
- Learn to be problem solvers
- Enjoy a painting process



Materi

Most of the materials for this lesson can be collected locally:

- Small sticks
- Pine needles
- Feathers
- Cotton rags
- Animal hair (caution here!)
- Soft pieces of bark
- Dry weeds
- String
- 9x12 white paper
- Tempera paint (mixed so that the paint is not too thick)

Procedure

1. Hold a class discussion about how a brush is made.
2. Show examples of different brushes she has made.
3. Demonstrate tying different materials to a stick.
4. Let children select sticks and materials to make a brush of their own using various materials for the head of the brush.
5. Once the brushes are made, spread newspapers out in 4-5 different spots in the classroom. Place paper and paint on top of them.
6. Divide the children divide into groups of 4 to 5 students. Let them pass around the different brushes so they can learn about different strokes and effects made by the various brush tips.
7. Help children understand that they are making painted lines that don't need to resemble shapes.

Assessment

This activity helps children make judgments about ways different art tools can be created and how various materials affect the resulting art. They also learn that inventing is fun.

Additional Activities

This project can be extended into other realms in that:

- Children see that the various effects caused by using the different brushes can make wonderful textural backgrounds for collages and other art projects.
- Children can draw or paint on rocks like a caveman.
- The class can examine a broom. Children can discuss if they think it would make a giant paintbrush.

Time

One art period, of approximately 45-60 minutes, can be set aside just for brush making. The next art period can be for making brush paintings.

Resources

Prints of early cave dwellers can be examined. Children can be asked questions such as: "What do you think cavemen used for art tools? Were they inventors also?"

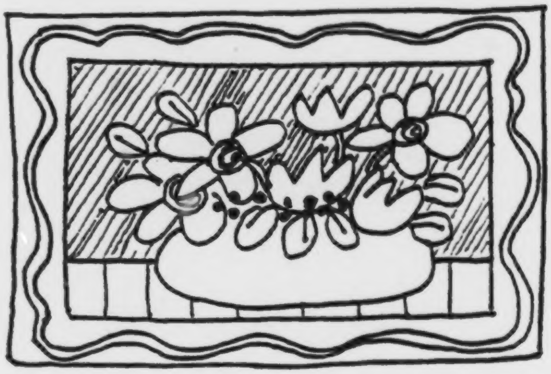
Art prints by Wassily Kandinsky such as "Sketch 1 for Composition VII" would be excellent for students to observe.

Sample Lesson Plan: Crayon Resist

Objectives

Through this activity students will:

- Discover and explore what happens when paint is brushed over a wax crayon.
- Think about how color choices and placement of shapes make a pleasing arrangement to child
- Learn to control hand movements and develop stronger hand skills.



Materials

- Wax crayons
- Watercolors or powdered tempera paint that is diluted.
- Brushes
- Water container
- Old newspapers for painting surface
- White paper - heavier than writing paper

Procedure

1. Give a piece of white paper, crayons and paints to each child. Children also need a water container to rinse the brushes. Put newspapers under these materials to keep the table top cleaner. Cleanup is also easier.

2. Ask children to draw shapes and details on paper with wax crayons. They need to press down hard on the paper with the crayons, but they do not need to crayon in spaces or areas as they can brush those in later with the watercolors or paints.

3. After the child is happy or feels he has completed his crayon line drawing, he can brush on the watercolors. Surprises happen with this type of painting. White crayon lines can suddenly look different.

Assessment

If the children enjoy the discovery and surprises that can happen with this process, it is successful. Children can learn to follow directions and also create their own ideas or images. They can suggest other ways to use Crayon Resist..

Additional Activities

- Draw a ghost or snow picture using only a white wax crayon, then paint over it with a darker paint color. Magic!
- Use any drawing subject or theme with this art process. It lends itself well to nature, to drawing objects, flowers, people and to make colorful design arrangements.
- Create a class mural: using crayon resist cutouts on a colored background.

Time

Forty-five minutes to one hour

Resources

Art prints

Sample Lesson Plan: Making Small Animals in Clay

Objectives

Through this activity students will:

- Learn to manipulate clay to form small animal shapes by gently pushing and squeezing the clay in different directions
- Learn to think about how shapes look from all sides
- Develop spatial thinking skills
- Learn more about the clay process; drying time, fitting and adding color on

Materials

- Moist clay
- Airtight container to store clay
- Work boards - they can be made from wooden boards that are smooth, but do not have a slick or varnished surface
- Clay tools for making eyes, textured surfaces

Procedure

1. Show children how to form a ball of clay about the size of a large egg or lemon. Roll the ball into an oval shape.

2. Squeeze out a head shape by gently pushing with a thumb and first finger. Don't squeeze too hard as the neck of animal can become too thin.

3. Show the children to draw a cross shape on the oval or stomach part.

4. Shape the four legs by pulling out the clay gently from each section of the cross shape. Note: often children of this age (6-7-year-Olds) will attach the legs. If the legs are attached they must carefully smooth out the lines where the forms come together otherwise legs may fall off. By pulling out the legs, the clay structure stays together better. It is important to keep the legs thick and sturdy. If they become too thin, the animals will not stand up.

5. Have everyone shape the features of the head, ears, paws, etc.

6. Position the animal. Does it stand up, sit or lie down the way the child wants it to?

7. Add textures to surface of clay if desired.

Assessment

Children learn to manipulate a new material and get a beginning understanding of the properties of clay. The activity helps them focus on animals and the different shapes and textures they have.

Additional Activities

- Children can make a diorama or 3-dimensional environment to display their animals. This display could involve the class in a cooperative art activity and be ongoing.
- Children could make their own boxes.

Time

45 minutes

Resources

Photographs of animals in their environment.

Sample Lesson Plan: Crayon Stencils and Shapes

Objectives

Through this activity students will:

- Discover that a simple cut-out shape can be used in a variety of ways
- Use scissors and continue to develop their cutting skills
- Use crayons in a different way

Materials

- Wax crayons
- Scissors
- White drawing paper
- Pencils - optional
- Paper for cutting out shapes

Procedure

1. Determine the theme or imagery to be used in this art project. For example: shapes found in our skies - stars, sun, moon, rainbows, clouds.

2. Ask children to draw and then cut out these shapes. Some children can cut without drawing. Suggest sizes so that images will fit on or under the drawing sheet.

3. Decide how shape may be used. Children can:

   Place shapes under paper. Hold paper down carefully and rub crayon over shape. They will want to move shapes around when they discover how the "crayon rubbings" happen. They may also want to experiment rubbing on different surfaces - the classroom floor, a brick wall, etc. Changing crayon colors also makes for interesting effects and textures.

   or

Place shapes on top of paper. Hold down the shape and draw lines out from and around the whole shape. Repeat over and over again, but change crayon colors to create a more interesting effect.

Assessment

Through this activity, children can observe and discuss the different effects in using crayons and a simple cut shape. They can also discover other artistic ways to use the shapes.

Additional Activities

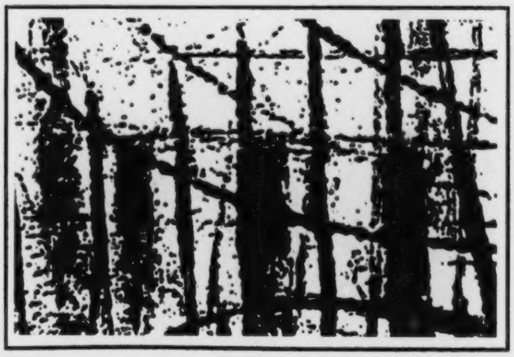
- Crayon rubbing is also effective used over coins, leaves or any raised images.
- Almost every holiday symbol can be cut out and used as a stencil for rubbing.

Time

45 minutes or extend for more discovery and completion time.

Resources

Art prints

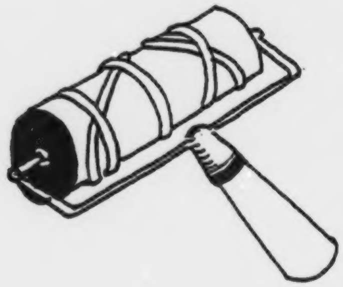


Sample Lesson Plan: Roller Printing

Objectives

Through this activity students will:

- Discover that printing is easy
- Understand that you repeat an idea over and over to get more copies
- Find many ways to use roller printing
- Observe that rolling is controlled by careful hand movements
- Think about how tracks are made by trucks, buses, carts



Materials

- Jars
- Round wooden pieces such as a cut-up broom stick
- Pencils
- Cans
- String, yarn
- Paint trays
- Tempera paint
- White paper
- Newspaper

Procedure

1. Show children how to wind string around a can or jar. Criss-cross and tie string.
2. Fill paint trays and spread out colors so that children can roll round objects in them.
3. Encourage children to take the paint covered cylinder and roll it on their paper very slowly.
4. Change color trays to create a colorful line pattern on the paper.

Assessment

Children can show different designs and finished products. They can talk about the differences that they observed as they rolled the cylinder and how easily the printing process makes lots of copies.

Additional Activities

- Use this process for creating backgrounds for collage work.
- Use the printed paper to make book covers or an endpaper in a book.
- Use rollers on a long, long piece of paper.

Time

45 minutes

Resources

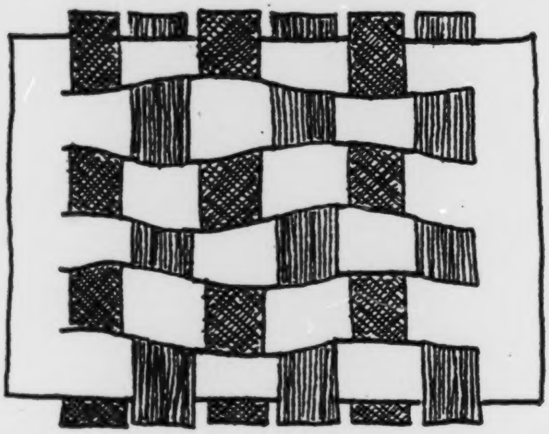
Art prints

Sample Lesson Plan: Weaving with Paper

Objectives

Through this activity students will:

- Cut a paper loom and create a paper weaving using strips of paper
- Discuss weaving and woven objects in their environment
- Learn words (vocabulary) that weavers use in their craft
- Become aware that weaving is an art form



Materials

- Colored construction paper - 30 cm x 46 cm
- Colored strips of paper for weaving (10-12 per student)
- Glue or paste
- Scissors
- Rulers

Procedures

1. Give each child a piece of colored construction paper, a ruler, a pencil, and scissors.

2. Show children how to place the paper on the desk the tall way and then to fold it up half way so that the bottom edge touches the top edge.

3. Have the children place the ruler lengthwise along the top of the open edge of folded paper. Draw a pencil line. First graders who know how to measure may do so. Teachers may want to pre-mark the paper for the students.

4. Ask children to cut from the folded edge of the paper loom up to the pencil line. They may not cut beyond the pencil line. The lines do not have to be exactly straight. It is important that they do not cut lines too closely together.

5. Give children paste and strips for weaving. Ask them to count out 10 of the strips for themselves.

6. Show the children how to start weaving. Be sure that they understand that the second strip is woven exactly opposite from the first. Repeat alternate weaving with each strip.

7. Help children trim the last strip so that it will fit in the remaining space and adjust the strips so that they line up with the edges. Children then paste down the ends so that they stay in place.

Assessment

Children will learn about parts of the loom as they discuss them in class. As they talk about their weavings, they will be able to note patterns of colors and lines.

Additional Activities

- Children can decorate the ends of weavings with remaining paper strips. They can crayon patterns on the weaving.
- They can weave with lines cut in a wavy pattern.

Time

45 minutes to an hour

Resources

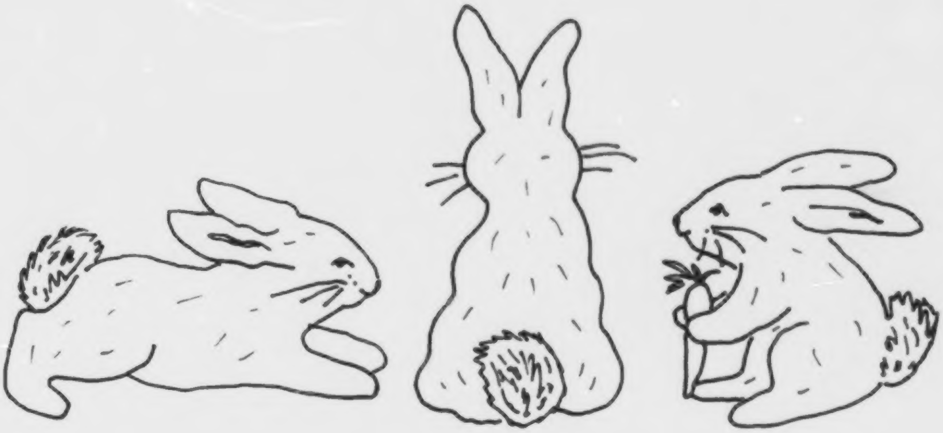
Pictures or samples of weavings

Sample Lesson Plan: Animal Drawing

Objectives

Through this activity students will:

- Observe an image and decide what geometric shapes are present in that image
- Learn to observe details, texture, color of an image.
- Begin to think about the environment that the animal lives in
- Express an idea of that image
- Think about how other artists have painted or drawn this image



Materials

- Pencil (the choice of drawing medium depends on the teacher and what is available in the classroom)
- White drawing paper

Procedures

1. Show the class examples of drawings and paintings that artists have drawn of the animal image. Discuss their ideas with them. A real rabbit in the classroom would be wonderful for observational studies.
2. Distribute paper and pencils.
3. Demonstrate how an oval and a circle can be combined to start to create a standing rabbit, a sitting rabbit, or a rabbit lying down.
4. Encourage children to add as many details to their rabbit as possible.

Assessment

Ask the children to discuss what it felt like to use geometric shapes to start their drawings. As they worked on this activity and talked about it, they can see how each one of the students interpreted the original shapes in their own drawings. They also can point out these shapes in the drawings and paintings of the artists discussed in class.

Additional Activities

- Stories can be invented about the rabbits in the children's drawings. Do they have big families? Are they hungry for lunch? What adventures do they have?
- Another medium can be used to make a rabbit... a fabric puppet, clay, or a paper rabbit made from a paper cylinder.
- Children can find circles and ovals in other animal pictures.

Time

45 minutes to an hour

Resources

Art prints (Albert Durer, for example. Drawings by local artists)

Books about rabbits and other animal books.

Sample Lesson Plan: Name Art

Objectives

Through this activity students will:

- Discover that letters drawn bold and large can make a colorful painting
- Observe color combinations and placement
- Discover new ways to make designs

Materials

- Tempera paint
- Brushes
- Container of water
- White paper

Procedures

1. Demonstrate how to best arrange paints and paper to prepare for painting.

2. Show the children how to take the brush and draw the first letter of their first name. Ask them to draw it big so that parts of it extend to the edges of the paper.

3. Let the children fill in the spaces with different colors of paint. They can outline the lines with a different colors. Do not leave any white space.

4. Ask the children to carry their paintings to a drying area when they are finished. Show them how to hold their paintings horizontally like a food tray so that the colors will not run down the paper.

5. Plan the clean up process carefully in relation to the water source. Ask children to clean their brushes and the area.

Assessment

Children will see how a letter can disappear yet be a source for a wonderful design. Let them talk about what they say when they used the different colors. For example, what happened when someone mixed too many colors together?

Additional Activities

- Children can paint using the first letter of a family member.
- Use a number or two and create a painting.

Time

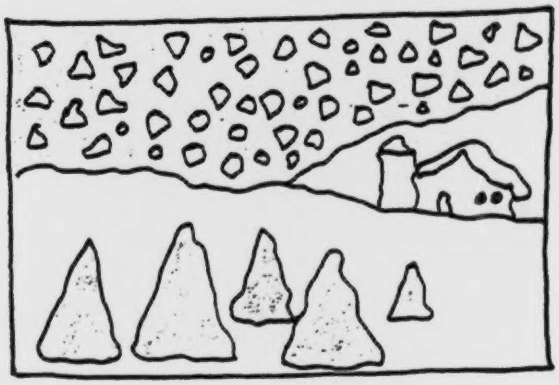
40-45 minutes. Some first graders will move through the painting project fast. The more involved the children are, the more likely they will show care in the painting process.

Sample Lesson Plan: Making a Landscape Collage

Objectives

Through this activity students will:

- Discover that a torn edge of paper can look very different from a cut edge. It can look like images we see in nature
- Think about the colors of hills and mountains during the different seasons
- Learn to manipulate paper without scissors
- Play with colors and images in imaginative ways



Materials

- Paste
- Background paper
- Colored construction paper, cut into smaller shapes for children to tear

Procedures

1. Demonstrate different ways of tearing paper such as:

   Tearing shapes in the air. Hold paper up and turn it with other hand, tearing carefully with the other

   Tear shapes flat on the table. Tear a straighter edge by placing one hand flat on the paper and tear down in a straight line.

   Make a circle: tear a circle and then a smaller circle using background color. Place the smaller circle over the larger circle and observe the appearance of a circle with the hole now.

2. Show children how a picture can change by moving shapes around.
3. Have children glue the pieces when they like the picture they have arranged. Keep the paper flat on the table and paste under the edge of the shape and then press down. Avoid moving the shapes around now.
4. Hold up your art after gluing down the shapes.
5. Use the scraps of paper for another collage.

Assessment

When children discuss the shapes they found as they tore the paper, they can point out the unexpected shapes that were created. They demonstrate what they were observing as they talk about what they found interesting: the combination of colors of paper, the shapes yielded through tearing.

Additional Activities

- Children can make a class mural together. They can begin making a collage using only three colors, later they can tear paper of different and more varied colors or textures.

- Torn shapes can be combined with cut shapes to make a more varied collage.

Time

Each collage project can last from 40-45 minutes.

Resources

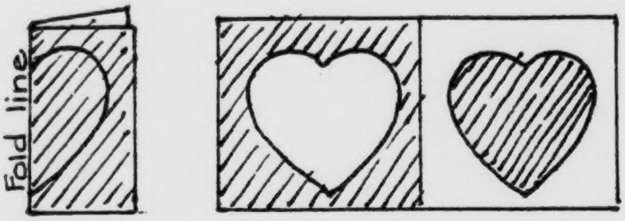
Prints of Henri Matisse's work
Illustrations in books using torn art such as Leo Leonni and Eric Carle

Sample Lesson Plan: Paper Fold Cutting

Objectives

Through this activity students will:

- Use scissors to develop cutting skills
- Begin to think about shapes and how to "see" their edges
- Save the negative shape of the cut out for future collage use
- Observe that when a folded cut shape is opened up, it makes a whole shape. This is how to make a form even or symmetrical on both sides



Materials

- Newspapers for practice cutting
- Colored construction paper
- Scissors
- Glue or paste

Procedures

1. Suggest designs that the children might try cut: birds, butterflies, trees, insects, masks, hearts, and plants.

2. Ask children to fold a sheet of paper down the middle. Show them how to hold the paper on the folded edge and cut into the outside edges. It is possible to make cuts along the fold as long as some of the paper is left uncut on the fold.

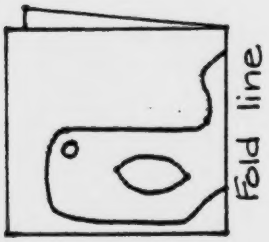
3. Glue or paste the child's favorite cutout on a sheet of colored paper.

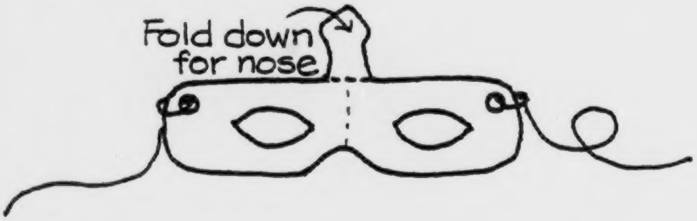
Assessment

Students can describe what they observed as they cut a shape from a folded piece of paper and can share their ideas about how to use this kind of shape cutting in other circumstances, such as making Christmas cards.

Additional Activities

- Cutouts can be hung by a thread to create a mobile.
- Cutouts can be mounted on windows to create an interesting effect.
- Children can make decorations for holidays using this idea.





Time

45 minutes extended as needed.

Resources

Magazine photos of many varied images from bottles to plant life would be helpful for children to observe.

Sample Lesson Plan: Box House Construction

Objective

Through this activity students will:

- Think about how they can construct a room or rooms within a small box space.
- Think about "sizes of objects" and how large or small windows should be.
- Think about making "a play object" for themselves. Can they use their miniature toys or dolls in their house after they have finished making it?
- Learn and use words to describe architectural elements that make up a house or room.

Materials

- A cardboard box - approximately 12 inches long, 4 to 4 ½ inches high and 6 inches wide. A shoe box works well. In centimeters: 30 x 12 x 16. The box may also have a lid which can be attached to make a yard or garden area.
- Glue
- Scissors
- For teacher, a sharp knife can be used to cut doors and windows for children.
- Pencils, colored markers.
- Bins or boxes of:
  small scraps of fabric for rugs and curtains
  paper scraps
  string
  small boxes to use as tables, bed, etc.
  beads, buttons, plastic tops, tiny mirrors, silver paper
  wire, sticks, small wood pieces, small branches, tiny seeds

Procedures:

1. Discuss and show children how they can arrange their house or room. Do they want the box to be vertical or horizontal? Children suggest door and window placement. Show the children how beds, tables, and other furniture can be made from small boxes and wood scraps. Note illustrations.

2. Give each child a working space with scissors and glue available. Newspapers covering work spaces make cleanup easier.

3. Let children gather materials from the counter or table and go back to their working space. Using the knife cut doors and windows where each child designates. Children can also come to the teacher in turns.

4. Allow a longer working time for this project as six- and seven-year olds become very involved in constructing their rooms or houses. Often they will want to play with them afterwards.

Assessment

Some questions that would help assess the success of this activity are:

- Did the child become involved in his/her house construction?
- Did they become inventive and discover ideas on their own?
- Did some children excel in building and display a talent for spacial thinking?
- Did the children develop other building ideas as they worked?

Additional Activities

- If the classroom is large enough, the class could construct a village or town. Large pieces of paper could be taped together to form a base for this construction. Streets, parks, and public areas could be marked out. Children's houses could be arranged near their school. An airport would be an exciting addition.

- A larger box could be collected or assembled to make a house, a castle, or special building. This construction could be large enough for them to play in.

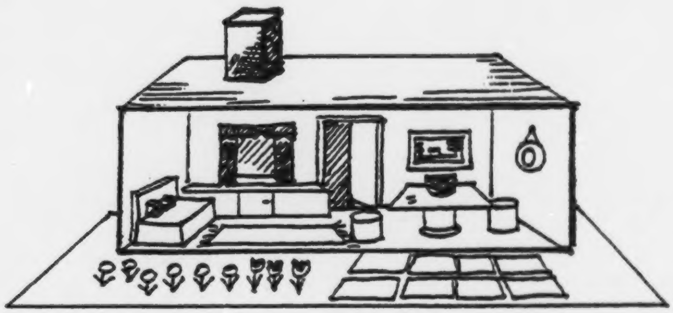
Time

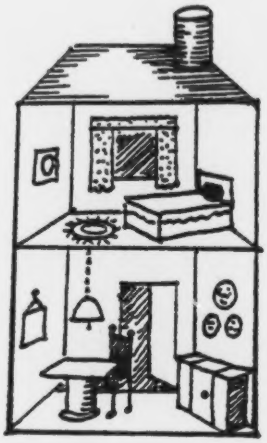
One hour and fifteen minutes for house or room construction.

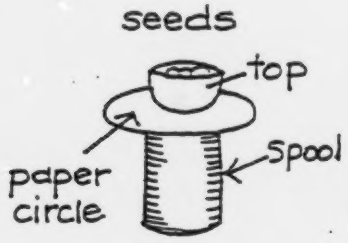
For a larger class project such as a village, a week or more is needed to complete the project. Periods of time need to be set aside throughout the school week.

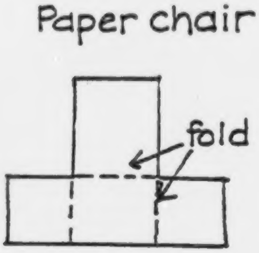
Resources

Pictures of houses, rooms, towns, and architectural details.









RECIPES: For glues, finger paints, and clays

Glue

Flour Paste

½ cup flour
Water

Add enough water to make a thin paste. Boil 5 minutes over a slow fire, stirring constantly. Cool and thin with water. Add a few drops of wintergreen or peppermint to keep it from spoiling. Keep in covered jar. Use in any projects requiring large quantities of paste.

Cornstarch Paste

2 tablespoons cornstarch
Water

Add enough cold water to make a smooth paste. Add boiling water until the mixture turns clear. Cook until it thickens, and remove from fire. This paste becomes thicker as it cools. It may be thinned with water. Use cornstarch paste on tissue paper or thin cloth since it is less likely to show than flour paste.

Finger Paint

Cornstarch Finger Paint

½ cup cornstarch
1 qt. boiling water

Dissolve the starch in a small amount of cold water and gradually add the hot water. Cook until clear. To keep all recipes from drying add 2 tablespoons of glycerine. Add oil of cloves or wintergreen to keep from souring. For color use poster paint, India ink, or powdered tempera mixed with water to a consistency of a smooth paste.

Liquid Starch Finger Paint

Liquid Starch
Powder Paint

Pour a tablespoon of liquid starch in the center of a sheet of dampened paper. Add a small amount of powder paint. Shaker cans or saltcellars are convenient to use. Work the color and the starch together. Spread it over the paper by hand.

Clay Dough - from "Art for the Fun of It" - Jenkins

There are many types of recipes; this is one of the quickest and simplest:

You need:
- 3 parts flour (nonself-rising wheat flour)
- 1 part salt
- 1 part water
- 3 tablespoons salad oil

You may vary the size of the recipe, but keep the proportions exact. Mix the ingredients until pliable. To color the dough, add food coloring to the water. Stored in an airtight container, playdough will keep about two weeks. To keep for several months, add 1 teaspoon of alum for each 2 cups of flour. Use more salt and less water when the children want to model small objects to harden and later paint. If this recipe is being used at school, double or triple it. It is important that each child have an ample quantity.

Try out finger paints, glue, paste, and clay dough before using them with children.

Art Materials

The sample art lesson that follows as well as many additional art projects can be based on the art materials found on the list below.

Supplies for Students

Drawing paper (white) — 40/50-lb. weight
— for painting projects it is important that paper be heavier
Colored paper — red, blue, yellow, green, orange, brown, and black

Rulers
Pencils — soft drawing pencils (with or without erasers)
Pens — drawing
Ink — black and colored
Crayons — wax (at least eight colors)
Markers — assorted colors
Paints — watercolors tempera (may be powder form)
Glue — recipes for glue and clay are included
Clay/play dough — covered container to store clay in
Scissors — small
Chalk — colored
Thumb tacks
Masking tape

Supplies for Teachers

Rulers — long and short
Scissors — good ones for paper and fabric
Hole punch for paper
Staplers and staples
Masking and clear tape
Thumb tacks
Soap for cleanup
Sponges
Rags
Paper cutter — often shared with other teachers

Collectible Materials

Parents can help children gather the following materials from their neighborhoods:

Old newspapers
Tin cans, Styrofoam
Different kinds of paper (cardboard, tissue, newsprint)
Fabric scraps (cotton, wool)
Wood scraps
Buttons
Yarn, string, ribbon
Straws
Clothes pins (for hanging art)
Art prints and postcards, magazine photos
Sticks, twigs
Smocks, aprons for students
Water containers

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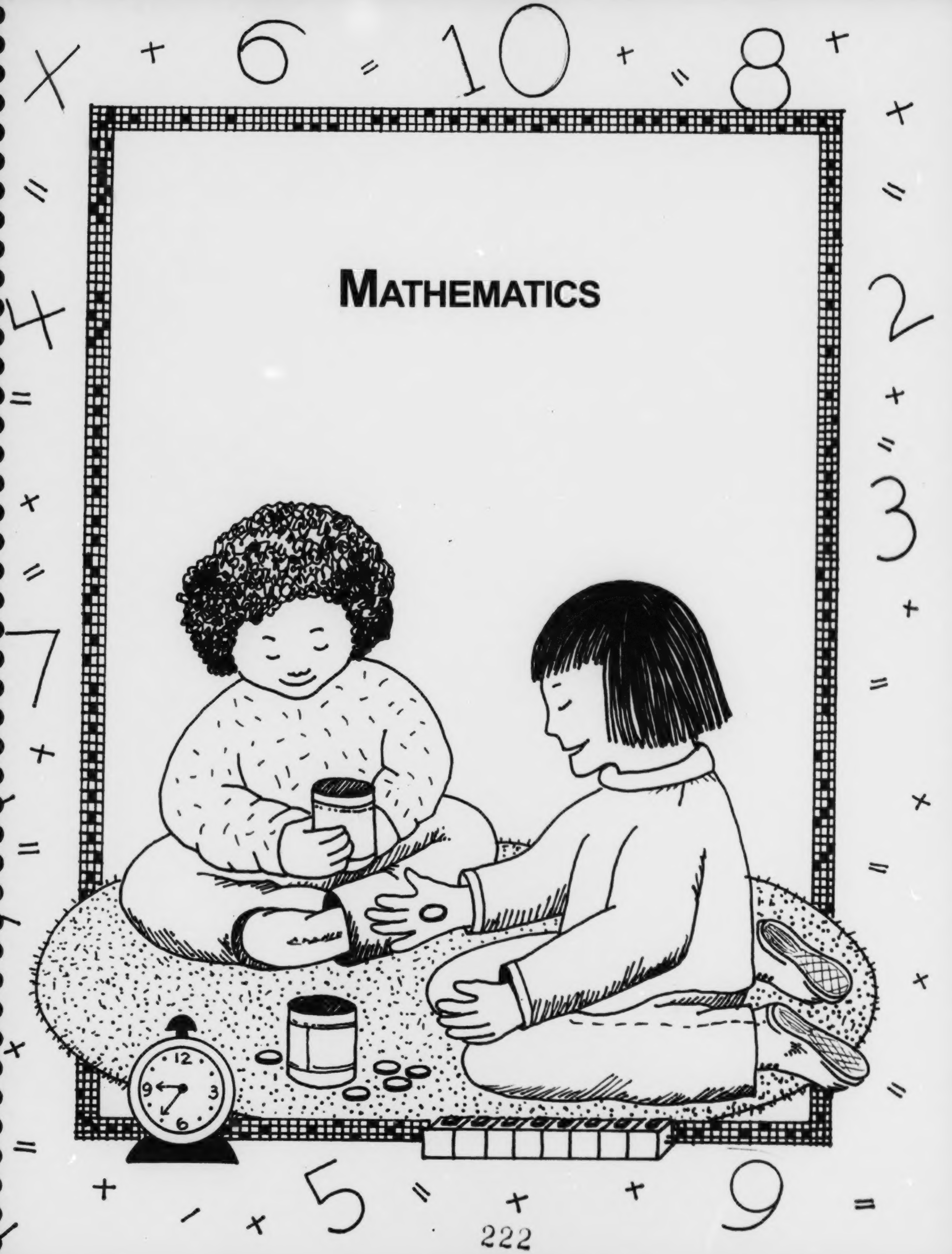
MATHEMATICS



XI. MATHEMATICS

Imagination is more important than knowledge.
Albert Einstein

Introduction

Three six- and seven-year olds, Maya, Evan, and Nadia, solved this problem:

> *Robin had 4 toy cars. Her friends gave her 7 more toy cars for her birthday. How many toy cars did she then have?*
>
> Although the three children concluded that Robin had 11 cars, each child solved the problem in a different way. Maya used toys and counted. She made a set of 4 toy cars and a set of 7 toy cars. She pushed them together and counted, "1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11," pointing to one car at a time as she counted.
>
> Evan used his fingers and counted up from one of the numbers given in the problem. He said, "4," paused, and continued, "5, 6, 7, 8, 9, 10, and 11," extending a finger with each count.
>
> Nadia used an addition fact and a relationship between the numbers to come up with an answer. She reasoned, "4 and 6 is 10, and 1 more is 11."

This vignette illustrates certain fundamental beliefs concerning the way children at this age construct their mathematical understanding and skill. These beliefs concern the nature of knowing and the nature of children. Generalizations about teaching mathematics in the primary years come from these beliefs.

The Nature of Knowing and the Nature of Children

Human beings come to know their world by successive approximation. In order to know something, we interact with it, making it uniquely ours. This belief is fundamental to a theory about knowledge and learning known as "constructivism." It implies that knowing is not a matter of receiving another person's truth. Rather, we selectively focus on phenomena in our environment, make sense out of them, and transform them in relation to the truths we have previously constructed. As Piaget (1970) says, "Knowledge, then, is a system of transformations that become progressively adequate." (p. 15) Children transform phenomena in their world into their own truths in ways that are unique to their maturing minds and temperaments. Young children's learning is inextricably intertwined with play, manipulating concrete objects, and verbalization.

Play *is* children's work. The Step by Step model builds on this premise. While immersed in stories, poems, drama, art, music, building, and gardening, children engage in tasks for sustained periods of time both because they are interested in what they are doing and because they are enjoying themselves.

Life Cycle of a Frog

The concrete objects in their environment are the raw material on which children act to build their personal realities. The understandings that they create are a by-product of their *actions* related to concrete objects. At first, children's understandings are tied to their actions on objects; their nascent understandings simply do not exist apart from such actions. For example, Maya used toy cars to solve the problem in the vignette because her understanding of numbers was tied to her actions on these concrete objects. Had toy cars been unavailable, counting would have been impossible. The ties that bind understanding to the physical world first loosen when children construct mental pictoral images of their actions on objects. Evan exemplifies the child whose thinking has evolved to this point. He produced mental images of countable objects and kept track of them by raising one finger at a time. Children ultimately reflect on their mental images.

They unify heretofore disparate images by organizing them into networks, or conceptual "road maps." The abstract relationships that these networks embody cease to rely on concrete objects or mental pictures. Nadia's reasoning shows thinking that has evolved to this abstract level.

Nascent understandings mature with verbalization. Language is the mental "handle" children hold onto while they transport to a world of mental images understandings that were initially tied to their concrete roots; ultimately these understandings are transported to logically related clusters. Moreover, children refine and extend their understandings by sharing them with others and by comparing their realities to those of others as they interact verbally. In the Step by Step Primary Program, children are given many opportunities for sharing, comparing, and discussing.

Implications for Teaching Mathematics to Six- and Seven-Year Olds

We can think of doing mathematics as a process of organizing and operating on the quantitative and spatial realities of our world. As such, it involves solving problems, reasoning, communicating, and making connections within and beyond mathematics. Generalizations about appropriate teaching practices integrate beliefs about how children learn and the processes involved in doing mathematics.

A constructivist belief about the nature of learning implies that teachers must "create environments in which they and their students are encouraged to think and explore" (Brooks & Brooks, 1993, p. 30). A constructivist point of view complements the Step by Step educational philosophy which encourages children to ask questions and solve problems. Problem solving is a process whereby an individual creates a path from the unknown to the known. Teachers who use problem-solving approaches to teaching create such an environment by inviting students to investigate and understand mathematical content. When teachers and students formulate problems, children are at the starting point of the solution path.

Children traverse this path by trying out various solution strategies such as acting out or using objects, making a picture or diagram, making an organized list, using or looking for a pattern. As students traverse the path, they should progress through stages of thought from concrete to pictoral imagery and then to abstract, logical relationships. Whenever children have problem solving experiences, they acquire understandings that become viable elements in their own rich conceptual networks. A Step by Step primary teacher appreciates the course each child traverses both from a developmental understanding and from the individual child's point of view.

Problems that facilitate mathematical learning embody significant mathematical ideas and relationships. They compel children to persist to the point of solution. They allow for divergent solution strategies. Their solutions extend beyond the specifics of the problem. They are interesting to a wide range of students. They support writing about, talking about, constructing, and representing children's ideas. (Think about the toy-car problem in the vignette and the ways in which it fits these criteria.)

Reasoning involves drawing logical conclusions using known facts and relationships to explain thinking, justifying answers and solution processes, and using patterns and relationships to analyze mathematical situations (National Council of Teachers of Mathematics, 1989, p. 29). Children should experience reasoning as informal invitations to share "how I know," or "why it makes sense to me." The invitation communicates the expectation that they, indeed, own their mathematical thinking.

In the Step by Step Primary Program, children should experience opportunities to communicate their mathematical understandings in a variety of ways: by constructing concrete or pictorial models or diagrams, by speaking or writing in the words of their everyday experience or in the words of mathematical terminology, and by writing mathematical symbols.

Because much of six- and seven-year olds' communication is verbal, teachers should provide opportunities to talk about mathematical ideas by asking questions. They can elicit thinking by asking such things as, "Can you tell us how you figured that out?" or, "Can you tell us how that makes sense to you?" Points to consider:

- Draw many classmates into the discussion.

  For example, after the first child answers a question that you have posed to the class, ask questions that show the extent to which the first child is communicating with classmates.

  For example, direct a question to a second child, such as, "Does that make sense to you?" If the second child answers affirmatively, then ask, "How would you say it in your own words?" If the second child answers negatively, then ask the first child, "Can you say it another way, such as with concrete objects, or in different words?" If the first child falters, ask the class, "Who thinks you understand [the first child] and can explain it another way?"

- Write children's verbalizations (either their words or their symbolic statements) on the board or on large paper in order to facilitate making links between the spoken and the written word.

- Invite the class to look for ways in which different students' statements are the same and are different.

- Resist the temptation to give solutions that bring closure in discussions; the lack of closure can be highly motivating.

Parent Involvement

The Step by Step Primary Program recognizes parents as the first teachers of the child. This is just as true with regard to mathematics as it is in any other content area. From early games of numbers and counting to telling children about money and economic choices, parents give mathematical information to children. By encouraging block and puzzle play of toddlers, parents set the stage for the early learning of spatial and geometric concepts. By playing counting games and telling time, parents also establish early number sense in their young children. These are natural learning situations which are built on as the child moves into the Step by Step Preschool and Primary Programs, because the parent is valued as a model for learning and teaching.

In the primary math program, parents are welcomed and encouraged to take part in classroom math lessons. Recognizing that all jobs have a mathematical component, parents are invited to share how mathematics is part of their daily lives by:

- Doing the marketing (paying for food, weighing vegetables)
- Measuring fabric, wood, and materials for building
- Keeping accounts and ledgers
- Calculating pay and rates for goods and services
- Budgeting food costs
- Estimating gasoline usage
- Assessing distances traveled

Math Games for Families

Children are encouraged to determine how mathematics affects their daily lives and routines. Together with parents, they can discover the numbers in their lives. Parents are encouraged to make up number games and play them with their children. For example:

Problem Solvers

The following games involve problem solving, computation, understanding number values, and chance.

Materials needed:

- Deck of cards
- Paper
- Pencil

What to do:

1. *Super sums.* Each player should write the numbers 1-12 on a piece of paper. The object of the game is to be the first one to cross off all the numbers on this list.

   Use only cards 1-6 in every suit (hearts, clubs, spades, diamonds). Each player picks two cards and adds up the numbers on them. The players can choose to mark off the numbers on the list by using the total value or by crossing off two or three numbers that make that value. For example, if the player picks a 5 and a 6, the player can choose to cross out 11, or 5 and 6, or 7 and 4, or 8 and 3, or 9 and 2, or 10 and 1, or 1, 2, and 8.

2. *Make 100.* Take out all the cards from the deck except ace through 6. Each player draws 8 cards from the deck. Each player decides whether to use a card in the tens place or the ones place so that the numbers total as close to 100 as possible without going over. For example, if a player draws two 1s (aces), a 2, a 5, two 3s, a 4, and a 6, he or she can choose to use the numbers in the following way:

   30, 40, 10, 5, 6, 1, 3, 2. This adds up to 97.

   These games help children develop different ways to see and work with numbers by using them in different combinations to achieve a goal.

Newspaper Search

Search through the newspaper for mathematical data.

Materials needed:

Newspaper

What to do:

1. *Numbers in the news.* Find the following things in the newspaper:

- A graph
- A number less than 10
- Something that comes in 2s, 3s, 4s
- A number more than 50
- The days of the week
- A number more than 100
- A number that is more than 100 but less than 999
- A symbol or word for millimeter, centimeter, meter
- A schedule of some kind
- A triangle
- A weather symbol
- A percent sign
- Sports statistics

One of the primary ways that people use numbers is for planning. Knowing how to plan, how much things will cost before going to the store, and how to read schedules and weather information from the paper will help your child understand the world.

Treasure Hunt

Everyone's house has hidden treasures. There is a lot of math that parents and children can do together.

Materials needed:

- Objects found in house
- Buttons
- Screws
- Washers
- Bottle caps
- Old keys

- Sea shells
- Rocks
- Or anything else you can count

What to do:

1. Find a container to hold the treasures.

2. Sort and classify the treasures. For example, do you have all the same sized screws and keys? How are they alike? How are they different?

3. Use these treasures to tell addition, subtraction, multiplication, and division stories. For example, if we share 17 buttons among three friends, how many will we each get? Will there be some left over? Or, if we have 3 shirts that need 6 buttons each, do we have enough buttons?

4. Organize the treasures by one characteristic and lay them end-to-end. Compare and contrast the different amounts of that type of treasure. For example, there are 3 short screws, 7 long screws, and 11 medium screws. There are 4 more medium screws than long ones. This may also provide an opportunity to talk about fractions: 7/21 or 1/3 of the screws are long.

   Finding a container to hold the treasures gives children practice in spatial problem solving. The treasures may help children understand the concepts of addition, subtraction, multiplication, and division because they can be moved around and grouped together so they can count the items.

   > (Problem Solvers, Treasure Hunt and Newspaper Search are adapted from *Helping Your Child Learn Math*, by Patsy Kanter).

Scope and Sequence

Instructional objectives for the Step by Step Primary Program in mathematics contains six content strands: Patterns & Relationships, Number Sense & Numeration, Concepts of Whole-Number Operations, Geometry & Spatial Sense, Measurement, and Statistics & Probability. A description of each of the strands and a statement of its role in a mathematics curriculum precedes the instructional objectives within the strand; they are excerpted from the *Curriculum and Evaluation Standards for School Mathematics* (National Council of Teachers of Mathematics [NCTM], 1989). The more detailed instructional suggestions that appear in that document are highly recommended to the reader.

Patterns & Relationships

Content Description

Patterns are everywhere. Children who are encouraged to look for patterns and to express them mathematically begin to understand how mathematics applies to the world in which they live. Identifying and working with a wide variety of patterns help children develop the ability to classify and organize information. Relating patterns in numbers, geometry, and measurement helps them understand connections among mathematical topics. Such connections foster the kind of mathematical thinking that serves as a foundation for the more abstract ideas studied in later grades. (NCTM, 1989, p. 60)

Content Objectives

1. Identify and describe patterns involving sound, motion, shape, or quantity.
2. Repeat events or designs using sound, motion, shape, or quantity.
3. Extend patterns involving sound, motion, shape, color, or quantity.
4. Translate patterns from one medium to another.

Number Sense & Numeration

Content Description

Children must understand numbers if they are to make sense of the ways numbers are used in their everyday world. They need to use numbers to quantify, to identify location, to identify a specific object in a collection, to name, and to measure. Furthermore, an understanding of place value is crucial for later work with numbers and computation.

Intuition about number relationships helps children make judgments about the reasonableness of computational results and of proposed solutions to numerical problems. Such intuition requires good number sense. Children with good number sense (1) have well-understood number meanings, (2) have developed multiple relationships among numbers, (3) recognize the relative magnitude of numbers, (4) know the relative effect of operating on numbers, and (5) develop referents for measures of common objects and situations in their environments. (NCTM, 1989, p. 38)

Content Objectives

1. Sort collections of objects.
    - Identify attributes of objects.
    - Sort collections of objects in a variety of ways.
2. Estimate how many items are in a collection.
    - Explore estimation of quantities of less than 100 by guessing.
3. Count the number of objects in a collection.
    - Recognize equivalent and nonequivalent sets.
    - Determine the cardinal number for a given set (0-100).
    - Select the numeral that names a group of objects and match a group of objects with the appropriate numeral.
    - Recognize, write, and orally name numbers 0-99.

- Identify numerical relations (greater than, less than, equal to) of numbers 0-99, and sequence numbers in ascending order.
- Use ordinal numbers first through ninth to indicate position.
- Translate words to numerals and numerals to words through 10.

4. Group collections of objects.
    - Demonstrate that a number may have several names by arranging objects in a variety of ways. For example, you can say *one* or *first*.
    - Model whole numbers through 99 using groups of tens and ones; orally name numbers.
    - Identify the number of tens and ones in a given number.
    - Identify place value through tens.

Concepts of Whole-Number Operations

Content Description

Children with good operation sense are able to apply operations meaningfully and with flexibility. One essential component of understanding an operation is recognizing conditions in real-world situations that indicate that the operation would be useful in those situations. Other components include building an awareness of models and the properties of an operation, seeing relationships among operations, and acquiring insight into the effects of an operation on a pair of numbers. These four components are aspects of operation sense. Operation sense interacts with number sense and enables students to make thoughtful decisions about the reasonableness of results. Furthermore, operation sense provides a framework for the conceptual development of mental and written computational procedures. (NCTM, 1989, p. 41)

Content Objectives

1. Explore addition and subtraction with words, pictures, and concrete models.
2. Use number sentences to record the results of acting-out situations that model addition and subtraction. For example, Tanya and Misha are sitting in a room.

Gregory comes into the room. How many children are now in the room? (Two plus one is three.)

3. Express a number in a variety of ways as the sum of two numbers.

4. Determine addition facts (sums to 18) and related subtraction facts using strategies such as counting all of a set, part/part/whole, counting on, counting back, counting up, doubles, property of zero, and commutativity of addition.

5. Recall addition facts (sums to ten) and related subtraction facts.

Geometry & Spatial Sense

Content Description

Geometry helps us represent and describe in an orderly manner the world in which we live. . . . Spatial understandings are necessary for interpreting, understanding, and appreciating our inherently geometric world. Insights and intuitions about two- and three-dimensional shapes and their characteristics, the interrelationships of shapes, and the effects of changes to shapes are important aspects of spatial sense. Children who develop a strong sense of spatial relationships and who master the concepts and language of geometry are better prepared to learn number and measurement ideas as well as other advanced mathematical topics. (NCTM, 1989, p. 48)

Content Objectives

1. Locate objects in the environment and use maps: "Locating and mapping involve questions such as the following: How do I tell someone where something is? How do I get from here to there? How far is it? How can I represent the physical world? How do I interpret representations of the physical world?" (California Dept. of Education, 1992, p. 113).
    - Use and model locational vocabulary (e.g., on, under, across, far away, before, after, between, near, close to, inside, outside, on, left, right).
    - Describe and create models (e.g., houses made of blocks, maps, floor plans) of their everyday world (e.g., home, neighborhood, school, classroom).

2. Visualize, describe, and represent shapes: "How can I represent a three-dimensional object on paper? How can I build a model by looking at a picture of

the object? How does your view of an object differ from mine because we are in different locations? What shapes can I see in different objects? How do I make a symmetrical design? Which shapes will tile a floor? These questions involve spatial sense." (California Dept. of Education, 1992, p. 114).

- Identify objects in the environment such as circles, squares, triangles, rectangles, balls, cubes, and cones in various orientations.
- Construct two- and three-dimensional shapes and figures and make tracings or drawings of them.

3. Investigate and predict the results of combining, partitioning, and changing shapes.
    - Determine figures which, when folded, have matching parts.
4. Relate geometric ideas to number and measurement ideas.
    - Identify spatial relations (e.g., larger, largest, smaller, smallest, same size, same shape).

Measurement

Content Description

Measurement is of central importance to the curriculum because of its power to help children see that mathematics is useful in everyday life and to help them develop many mathematical concepts and skills. Measuring . . . encourages children to be actively involved in solving and discussing problems. (NCTM, 1989, p. 51)

Content Objectives

1. Distinguish among the attributes of length, capacity, weight, time, temperature.
2. Directly compare two objects' length (longer, shorter), or capacity (more, less), or weight (heavier, lighter), or temperature (warmer, cooler).
3. Compare or order shapes using terms (same, larger, smaller, largest, smallest).
4. Use nonstandard units to estimate and measure length, time, and weight.

5. Select appropriate standard units for measuring length and time.

6. Use standard units to estimate and measure length and time.

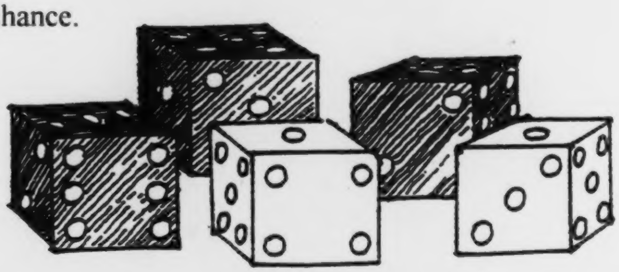
Statistics & Probability

Content Description

Collecting, organizing, describing, displaying, and interpreting data, as well as making decisions and predictions on the basis of that information, ... are particularly appropriate for young children because [these processes] can be used to solve problems that often are inherently interesting, represent significant applications of mathematics to practical questions, and offer rich opportunities for mathematical inquiry. The study of statistics and probability highlights the importance of questioning, conjecturing, and searching for relationships when formulating and solving real-world problems. (NCTM, 1989)

Content Objectives

1. Collect, organize, and describe data.
    - Construct graphs using concrete objects, blocks or squares.
2. Construct, read, and interpret displays of data.
    - Interpret data by reading bar graphs and pictographs using whole- unit data.
3. Explore concepts of chance.



Summary

The scope of concepts presented in the preceding section is the vehicle for meeting the general goals for mathematics in the Step by Step Primary Program, as stated in Chapter II. Full exploration of each of the six strands promotes the kind of comprehensive mathematical learning described in this chapter. Teachers in the primary program can design lessons focusing on patterns and relationships in response to a child's comments or questions. Small and large groups can be structured to pursue the solution of a difficult problem. Individual challenges can be created for pairs of children to solve in the area of measurement, probability, or data collection. In each of these methods, teachers are able to intentionally modify the activity to complement and extend the developmental level of the children involved. The teacher can use the scope of concepts and adapt activities within them to the specific needs and abilities of the children in her class. This practice of individualizing within the curriculum is basic to the Step by Step Primary Program.

Following are sample lessons presented as models for one way of structuring class lessons in small groups of four, whole class, or half class. It is important to note the attention given to various learning styles in each of these lessons. That is, rhythm is used in the lesson and visual pictures and symbols are incorporated as well as movement and spoken language. Offering these various means of communicating lets children know that their unique styles and tendencies are respected and encouraged.

Sample Lesson Plan: Patterns & Relationships

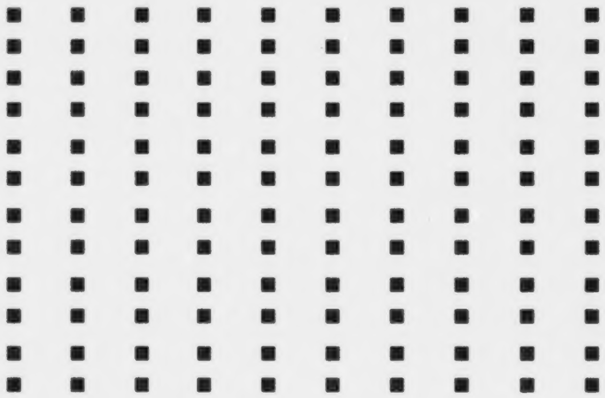
Objective

Repeat events or designs using sound, motion, shape or quantity.

Materials

- A variety of instruments (either traditional instruments such as a drum, cymbal, triangle, etc., or improvised ones such as a cake tin, a glass bottle, a wooden box).

- A floor geoboard for each group: To make geoboards on your classroom floor, place gummed dots, pieces of tape, or dots of paint at rectangular intervals as in the figure that follows. Make one 10 by 10 dot geoboard for each group of children who will be participating. If the floor is covered with square tiles, the corners of the tiles can serve as points on which to place the dots. If the length of the side is not a comfortable stepping distance, use the length of two tiles or one and one-half tiles as a unit. If the floor is not covered with tiles, or if you are marking geoboards on the ground, use the corners of precut squares of heavy paper to guide you or the children in placing the dots in a uniform pattern.



- Dot paper for each group.

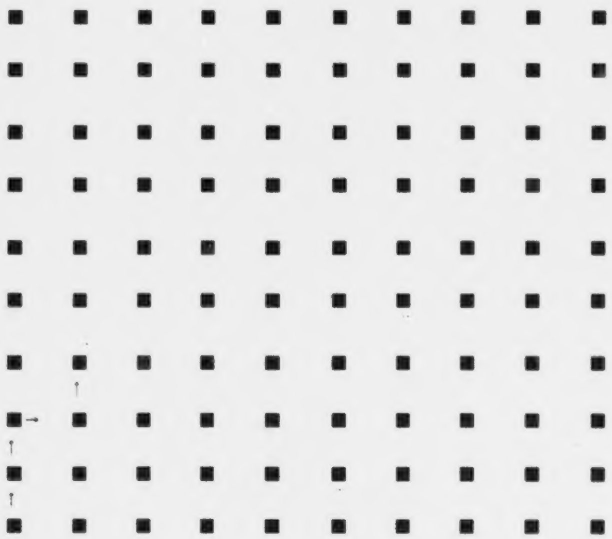
- Enlarged dot paper at the front of the room.

- A place marker for each child (e.g., a button, block, chip, small piece of paper).

Procedure

1. Before introducing movement activities on the floor geoboard, establish rules such as the following:
    - Two people may not occupy the same point at the same time.
    - You may travel forward, backward, or sideways, but you must step on each dot that you pass over while moving.
    - On each beat of the instruments you may step on only one new point. You may step to each new point with one foot only or you may step with one foot on the beat and bring the other foot beside it before the next beat.
2. Warming Up: Ask each child to begin on a dot on the group geoboard. To a slow beat each child creates a path by moving forward, backward, sideways, forward/sideways, and backward/sideways. In order to avoid collisions, children must solve the problem of combining movements in different directions while at the same time remaining aware of others who share the same space. Change the tempo of the beats several times in order to find a comfortable tempo for the children.
3. Sound/Movement Patterns: Play a sound pattern where each different sound element is made with a different instrument. For example: 2 beats with the cake tin, 2 beats with a glass bottle, 1 beat with a wooden box. Associate a movement pattern on the geoboard with the sound pattern. For example:
    - 2 beats (cake tin) ⇒ 2 steps forward
    - 2 beats (glass bottle) ⇒ 1 step right
    - 1 beat (wooden box) ⇒ 1 step forward
4. Before students move through the pattern, ask them to place their markers at their beginning spots. Move through the pattern with 3-4 iterations. Ask students to stop and look at their markers at their beginning spots. Ask them if they can "see" the path they took to get from their beginning spots

to their present spots. At the class geoboard in the front of the room, draw a beginning spot. Repeat the music pattern and draw the representation of the associated movement pattern, as illustrated below. Allow the children to make up another sound pattern. Designate one child to "record" the pattern on the class geoboard in the front of the room. After a few iterations of the pattern, ask the children to record the pattern on their dot paper. Allow children to continue within their groups. They may choose to create their patterns in any mode—visual, movement, or sound—first and then incorporate each of the remaining two modes, one at a time.



Sample Lesson Plan: Number Sense & Numeration

Objective

Identify attributes of objects.

Materials

- "Find the Doll" logic packets—1 per group of 4 students. Each packet comes in a bag and contains (see drawings at the end of this chapter):
  - Find the Doll" clue cards, duplicated on heavy paper.
  - 6 "Find The Doll" picture cards duplicated on a different color card stock.
- One enlarged set of "Find the Doll" picture cards posted in the front of the classroom.

Procedure

1. Assign students to groups of 4. (If working in cooperative groups is new to your students, it may be easier to require them to work in pairs.) Distribute one logic packet to each group (or pair). Tell them to open their packets and find the six picture cards with dolls. Allow students a minute to look at the cards. Review the vocabulary they will need for the activity: dress, curly hair, bow, and shoes.

2. Tell the students that they will work together to find the house that matches all four clue cards in their packets. Tell students that each of them should pick up one clue card and look at it, while leaving the six picture cards untouched.

3. Hold up or describe a particular clue card (for example, dress). Ask students to raise their hand if they have that clue. Each group (or pair) should have one hand raised.

4. Point to each of the six enlarged dolls in the front of the room. Ask students which houses match the clue (wearing a dress). Turn over every picture card that does not fit the clue (dolls not wearing a dress). Direct

students to place the "Find the Doll" picture cards that do not fit the clue in the bag in which they received their packet.

5. Work with the whole class until you feel that most students understand the elimination process. Then, direct the groups (or pairs) to use the remaining clues in their packets to find the doll. If students are relatively unaccustomed to working in groups or pairs, you might suggest that they take turns selecting a clue card and looking for the picture cards that match it. While one person is deciding, the remaining student(s) think about what they would do with that clue card so they know whether or not they agree with the student who is taking a turn. After the student has completed the turn, the group (or pair) mates tell whether they agree, and if they don't agree, share their reasoning.

6. After the groups (or pairs) have found the doll, review the clues with the whole class and the enlarged pictures in the front of the classroom. While students read each clue, ask a volunteer to turn over dolls that do not match the clue.

Additional Activities

Create your own logic packets. This is possibly something parents can design and make.

- Begin with one simple object/picture, such as a flower. Draw its outline identically six times. Use a pencil to draw a star on the picture that will ultimately be the solution. (The star will be erased when you finish the cards.)

- Determine the four characteristics that will be contained in the drawing that matches all clues. These characteristics will become your four clues, such as four petals, two leaves, a bee on it, and in a flowerpot). Use them to make four clue cards.

- Add one new characteristic at a time to each object/picture, such as four petals. Be sure that each characteristic is missing from at least one picture card, such as drawing one flower with five petals. Continue with this process until you have added four characteristics. *All the final pictures, except the correct one, should match three of the four clue cards.*

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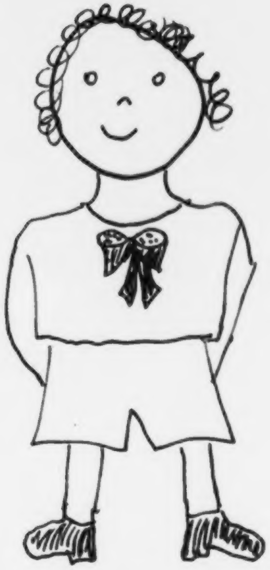
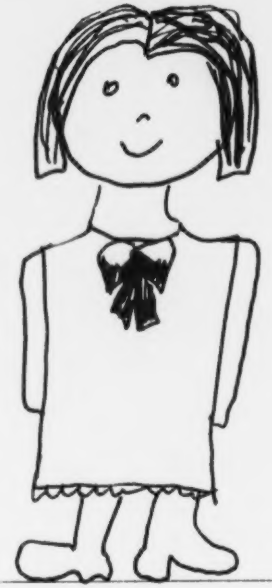
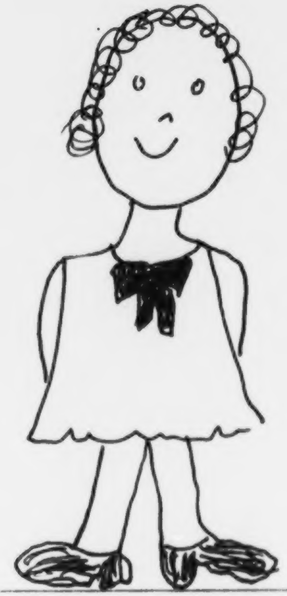
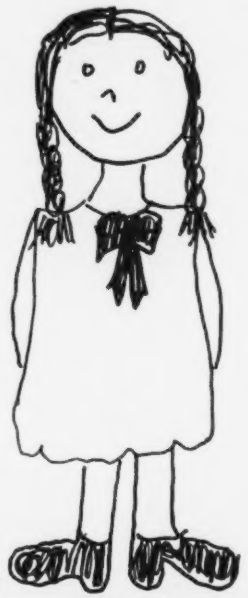
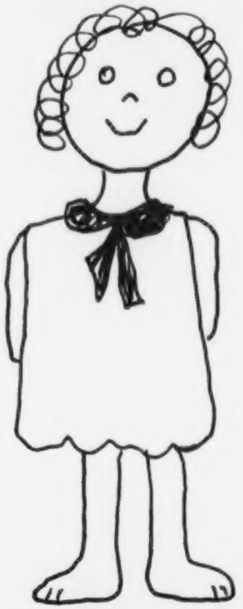
"Find the Doll" Picture Cards

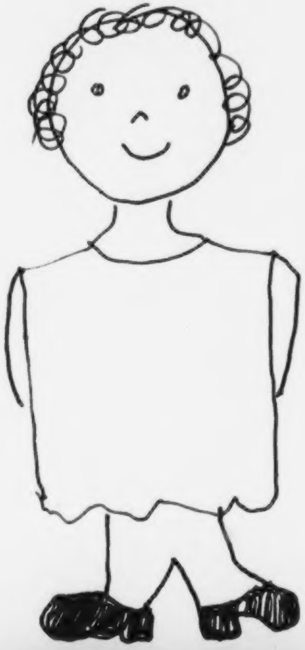




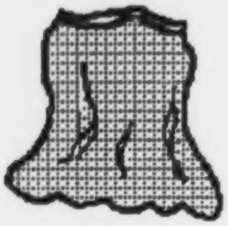






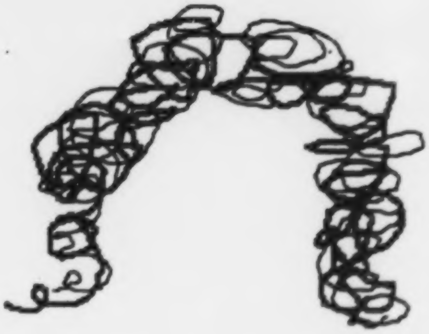


"Find the Doll"
Clue Card



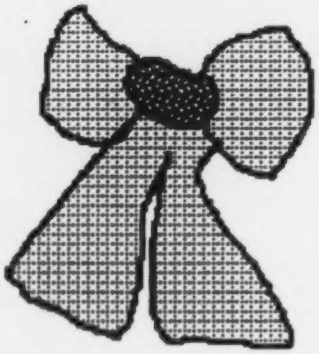
dress

"Find the Doll"
Clue Card



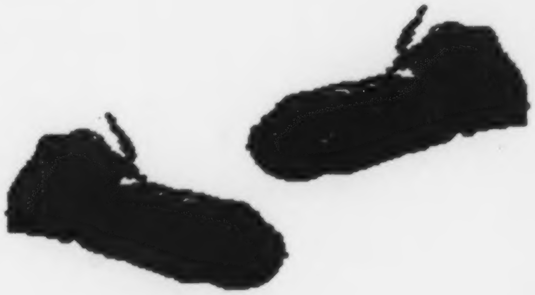
curly hair

"Find the Doll"
Clue Card



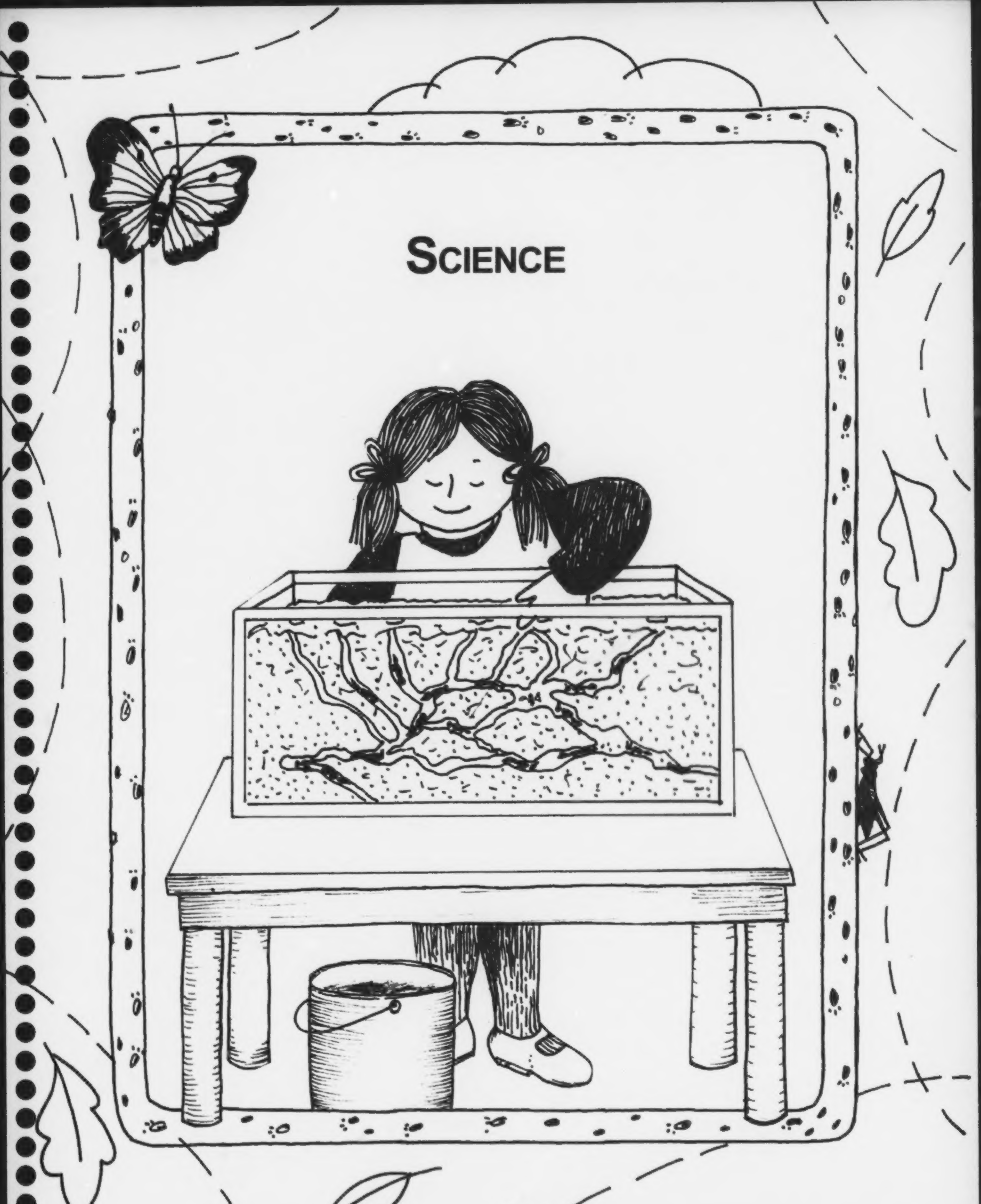
bow

"Find the Doll"
Clue Card



shoes

SCIENCE



XII. SCIENCE

Give me a fish and I eat for a day, teach me to fish and I eat for a lifetime.

Ancient Proverb

Overview

When we teach children the science process skills, we teach them to fish and eat for a lifetime.

This philosophy reflects the shift in science education that has occurred in recent years. Science is now being taught as a *mode of inquiry* rather than as a *series of facts* to be memorized. The development of thinking and problem solving skills is a foremost goal of elementary science education. Learning how to think critically is dependent upon the development of process skills such as observing, classifying, comparing and contrasting, measuring, communicating, recording, organizing and interpreting data, inferring, predicting, making deductions, using numbers, and replicating procedures.

In the Step by Step Primary Program, we encourage children to learn about their world through questioning and then searching for answers to their own questions. Through "hands-on" discovery approach children both do science and think about what they are doing. Research shows that children learn best by doing, moreover they learn more when they think about what they are doing. Open-ended activities with numerous acceptable responses offer the greatest benefit to students. Rather than always being the person to give answers, the teacher creates an environment where she and her students are active participants in a search for answers. With skillful guidance, children can sharpen their abilities to think critically and to observe and describe accurately. Teachers can encourage children to work out explanations for what they observe and to devise ways to test such ideas. Children benefit from working through this process, learning just as much (and sometimes more) from an idea which proves to be incorrect as from one that proves to be correct.

Students should be given ample opportunities to work in small groups and to interact with each other, with other living things, and with their environment in ways that promote respect. It is important to encourage students to reach their own individual conclusions, verbally expressing why they have reached these conclusions.

By guiding students through a range of inquiry activities, the teacher lays the attitudinal, experiential, and conceptional foundation for future learning. At the same time, it is important for the teacher to remain flexible and seize the "teachable moments," further encouraging students to explore and wonder about the world around them.

In selecting and organizing the science subject matter in this chapter, three criteria were considered.

1. Lessons and their extensions were chosen that were appropriate for the developmental and learning abilities of first-grade students. Emphasis is placed on gaining experience with natural phenomena in the child's world.

2. Lessons are provided in each of the three major disciplines of scientific study. These are:

    - Life Science (the study of biological systems)

    - Physical Science (the study of matter and energy)

    - Earth Science (the study of the earth and the universe around it)

3. The lessons, coupled with their extensions, will direct class work *toward* ideas, questioning, and thinking and *away from* memorizing concepts and predetermined answers.

The long-range goal of this approach to science in the primary program is to establish a common core of learning in science, mathematics, and life skills that centers on scientific thinking. For children six and seven years of age, a fact-based, detailed understanding of each of the separate disciplines is not appropriate. Enrichment is achieved by allowing teachers and students to make interdisciplinary connections among science, math, the arts, humanities, technology , and vocational studies. Six- and seven-year-old children should be learning to express themselves and to ask and actively seek answers to questions. But teachers should not expect them to give scientifically accurate explanations for their observations at this age. Theory can wait until later years.

Questions to Extend Children's Thinking Skills

When children have questions and make discoveries, the teacher can help extend their thinking skills by asking open-ended questions such as:

What can you tell me about this?

How else could you do it?

How many things can you find about these items that are the same? That are different?

What else does this make you think of or remind you of?

How do you think you could find out?

What do you predict would happen if...?

Tell me what happened.

Explain what you did. Did you think that would happen?

What can you do next time?

What does that remind you of?

What will you do next time?

What could you try instead of what you did?

Tell us what it looks (feels, sounds) like.

When you are teaching, ask thought-provoking questions like: "Why?" "How" "What If?" Avoid simple memory questions like "What is it?" Wait a sufficient time for students to consider questions before they respond. Encourage students to observe, compare, sort, predict, experiment, share, and record information.

Summary

In the Step by Step Primary Program, the teacher helps students understand that science is more than just facts. Science is both a process and a body of information through which we discover and understand the world around us. When an adult constantly and exclusively provides facts for children, it can cause the end of their curiousness about an object. When an adult asks probing questions and reacts positively to children's responses no matter how accurate, it helps children to remain enthusiastic while pursuing answers to their own questions. It is important for teachers to consciously model active thinking and inquiring attitudes. Teachers remind students that science is all about searching for answers by both telling and showing them the process of inquiry. Teachers should admit if they do not know the answer to a question and join in the search for answers. Teachers share their questions about the world and their belief that finding the answers to questions and problems is both important and fun. It is by seeing these attitudes and strategies modeled that children develop intellectual habits.

Life Science

The Human Body and its Senses

Concepts

The human body receives information about itself and its surroundings through its five senses: sight, hearing, smell, taste, and touch. Usually the senses work together to gather information, with different senses providing different information. Children are fascinated to learn about how each of the senses works, to conduct some experiments with each sense, and to experiment with blocking or confusing sensory information.

Sample Lesson: Hearing

Objectives

Through this activity students will:

- Understand that all sound begins as vibration
- Learn how sound travels
- Create some simple sound instruments
- Learn about the structure of the ear

Materials

- A variety of instruments that clearly demonstrate vibration such as a guitar, a cut-off balloon neck, a ruler, a wine glass partially filled with water, a chicken squawker (see a description of this below).

- A funnel, rubber tubing, salt, rubber bands, sheets of waxed paper, toilet paper tubes, paper cups, lengths of string cut to about 80 cm., paper clips, coat hangers with ½ m. strings tied on each corner, a tuning fork.

- A picture or model of the inside of an ear.

Procedure

1. Tell the children "Watch and listen as I do something and tell me what you see and hear." Then do any of the following: twang a ruler over the edge of a desk, blow on a cut-off balloon mouthpiece, rub your wet finger around the rim of a wineglass with water in it, strum a guitar (or shoe box lid version made with rubber bands), make a chicken squawker squawk (see directions below).

2. When children tell you that they hear noises and they see movement, explain that all sound is caused by something moving or "vibrations."

3. Point out that you can feel your voice box vibrating as you speak. To illustrate this, have children put their fingers over their throat and hum--first a low tone, then a high tone, then whisper, then speak in a normal voice.

4. Ask the children: "How do we know that sound has been made? What part of our body tells us? (Our ears).

5. Explain that sound travels from the thing that is vibrating, creating air waves which travel to our ear where they make our ear drum vibrate and send a message to our brain.

6. Demonstrate how waves move by raising and lowering one end of a jump rope or a string attached to a chair. The rope will move in wave patterns. A second way of demonstrating waves is to drop a pebble into a pan of water and watch the waves move out from the center of the splash.

7. Point out that we can't see the waves of sound because they are traveling in air, but we can imagine them like this: Demonstrate with a funnel that has a balloon skin stretched over it and a length of tubing attached to the small end of funnel. "This balloon skin is like your eardrum. When the sound hits your eardrum (sprinkle a little salt onto balloon skin), it makes your eardrum vibrate like this (hum into the tube and hold the funnel in front of the children so that they can see the salt vibrating on the balloon skin).

8. Show what is inside the ear, demonstrating with the model or a picture. Point out that the ear has three parts: 1) the outer ear (the part we see and one which helps funnel sounds towards the inside of your head); 2) the middle ear (where the eardrum is), and 3) the inner ear which has little tiny bones that vibrate and send a message through a nerve to your brain. (Show how one of the little bones looks like a stirrup, and is the smallest bone in your body).

9. Point out that when the sound stops, the ear drum stops vibrating.

10. Caution the children that the eardrum is extremely delicate. Tell them never to stick anything sharp into their ears or the ear drum could rip and they could lose their sense of hearing. Also warn them of the dangers of listening to sounds that are too loud because this loudness can damage the eardrum.

11. Ask the children:

    - "How does sound travel? (In waves).

- "What is sound traveling through now to get from my voice box to your ears?" (Air)

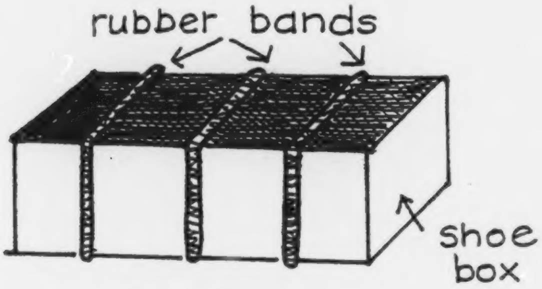
- "Do you think sound waves can travel through other things like liquids or water or through solid things like tables or strings?" (Ask children whether or not they have been able to hear underwater when swimming. Point out how people used to tell if a train was coming by putting their ears to the train track.)

12. If you have a tuning fork, use it to hear how sounds travel through solids--hit it gently on the edge of a table and ask children to raise a hand when the sound hits their ear. Then ask the children to place one ear against a long table and, again, to raise a hand when they hear a sound through the table. Hit the tuning fork then place its stem against the table.

13. To show how sound travels through a solid (like string), ask the children to hold strings attached to wire coat hangers carefully in the outer ear canal. Then, making sure that the coat hanger can swing freely, get them to lean over and let it bounce off of different surfaces. They will hear noises like church bells traveling through the strings. Someone standing next to you cannot hear the sounds since they are traveling through the string, not through the air. (Management tip--when it's not in use, have the children hang their coat hanger on an overturned chair leg to avoid tangling strings.)

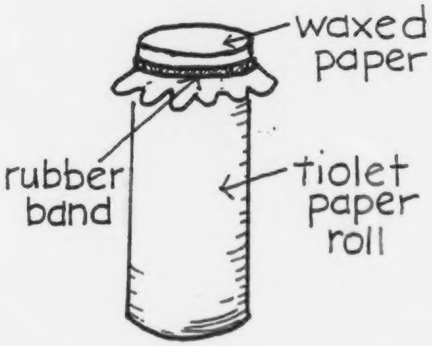
14. Let the children make several instruments and then try to see which part is vibrating. Possibilities for homemade instruments are: a shoe-box lid guitar strung with different-width rubber bands; a homemade kazoo made of a toilet paper tube with a sheet of waxed paper placed over one end and held in place by a rubber band; a chicken squawker made from a paper cup with a small hole poked into bottom (a string threaded through the opening is tied and held in place inside the cup by a paper clip). When moistened fingers are run down the length of the string, a chicken squawker makes a noise like a squawking chicken. When plucked, this string emits a different sound. When all students have created their instruments, play a favorite song together.

INSTRUMENTS

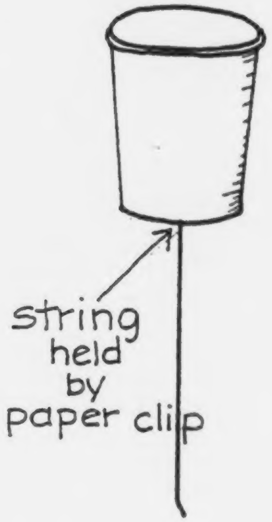

rubber bands
shoe box

Guitar

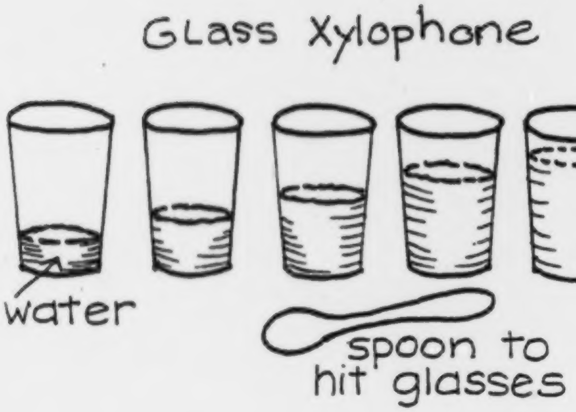
Kazoo

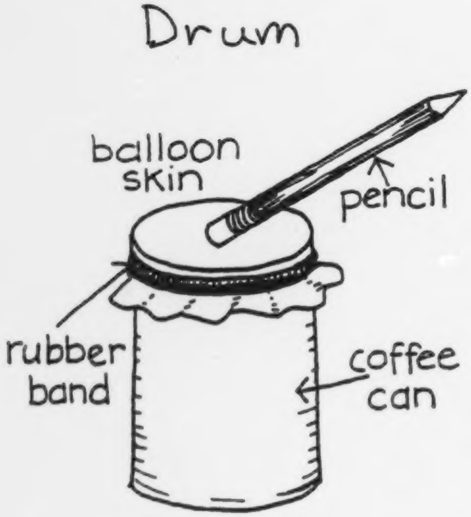

waxed paper
rubber band
tiolet paper roll

Chicken Squawker


string held by paper clip

INSTRUMENTS


Glass Xylophone
water
spoon to hit glasses


Drum
balloon skin
pencil
rubber band
coffee can

Assessment

- Children can demonstrate what they have learned about hearing by taking a sound walk around the school. Call on them to identify different sounds they hear and to point out what is making the sound. Children should be able to verbalize both what is vibrating and what the sound is traveling through.

- Children can be asked to create an instrument of their own; to play that instrument for the class, to explain how it makes sound, and to demonstrate how to vary the sound.

Additional Activities

- Make a whole orchestra of instruments such as rubber-band guitars, drinking-straw oboes, water-bottle xylophones, and coffee-can drums (using balloon skins).

- Challenge children to create an instrument that is the loudest, the softest, the most capable of playing a recognizable tune, the most like a bell or whistle or guitar, or one that makes the widest range of sounds.

- Look for natural objects that can be used to create sounds-gourds, seed pods, pine needles that can be brushed on different surfaces, sticks to hit together.

- To see how important the integration of one sense with others is, try watching a movie without the sound. Can the children follow a scene? Show it again with sound playing. Try another segment with sound only, no picture, then again with both.

- Use a tape recorder to record various familiar sounds. How many can the children identify? Can they say what is vibrating each time?

- Challenge children to see how many different sounds they can create just using their bodies (finger snaps, whistles, hand claps, lip smacks, humming, foot stomping).

- Ask children to see how many different sounds they can create using the same object.

- Make tin-can telephones by poking holes in the bottom of two tin cans and threading a long length of string between the two cans. Ask the children to hold the string taut; one can talk while the other listens in the tin-can telephone. Caution the children never to yell into the "telephone" as the cans will amplify sounds and hurt the other child's ears.

- Examine a variety of real musical instruments to determine what part creates vibrations.

- Take the children on a sound walk, listening for man-made and natural sounds.

- Play "telephone." Seat students in a circle and whisper a simple tongue-twister into a student's ear. That student then whispers it into the next person's ear, and so on around the circle. The children are only allowed to say the tongue-twister once and the next person must tell the next child what they believe they heard. Compare the response given by the last student with the original message.

Studies of the five senses have numerous possibilities for extensions, for example:

- Go on a sense walk, focusing on just one sense such as hearing, smell, touch, or sight.

- Learn the anatomy of each sensory organ--the lens, retina, and optic nerve of the eye; the mouth's taste buds as they distinguish between sweet, salty, sour, and bitter tastes; the skin's pressure and pain receptors; the nose's olfactory nerves as they distinguish spicy, flowery, fruity, resinous, putrid, and burnt smells.

- Learn how and why to protect your sense organs from loud sounds, bright lights, and strong odors.

- Learn how people who have sensory disabilities cope, such as with seeing-eye dogs, hearing aids, braille, and sign language.

- Make sensory "mystery boxes" in which the children can match and/or identify sensory-related items such as cotton balls soaked with different scents (perfumes, flavor extracts, spices, coffee grounds). Create texture boxes with a hole and tube sock attached through which a child's hand can reach to feel different objects. Fill plastic eggs, opaque jars, or film containers with different materials (rice, beads, coins, pebbles) and ask the children to match the ingredients with visible ones using only their hearing and the feel of the containers when they are shaken.

- Describe an edible object (piece of candy or an apple slice) using all five senses.
- Explore differences between the senses that human beings have with the "super" senses of certain animals(a hawk's vision, a dog's sense of smell, a bat's hearing, a spider's sense of touch, a snake's ability to feel vibrations but not to hear).
- Use cooking experiences as a way to explore the five senses.

Ants

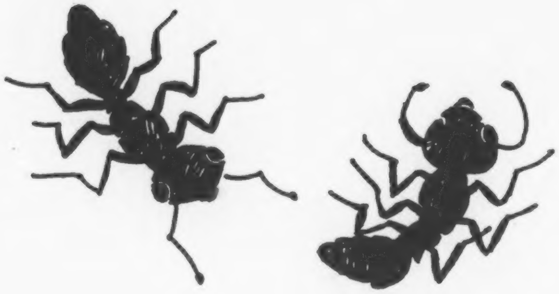
Concepts

Ants are social beings; they live in complex societies in which different members have their own specific duties to fulfill. These duties may change as the ant grows older. Ants exchange information by communicating with their antennae and by releasing special scents called pheromones.

Ants have been on Earth for 100 million years, according to fossil records. Today there are 8,800 known species of ants. They help aerate and enrich the soil, clean up dead and decaying plant and animal matter, disseminate seeds, and keep the balance of nature by preying on spiders and insects.

Ant species live in a variety of habitats. For many species, there is only one queen per colony. Queens might live from 6 to 25 years, spending their entire life in a chamber, laying eggs and being fed and groomed by workers. Most of the offspring are female. Male ant eggs are usually laid once each year, producing winged males whose only job in life is to mate with the female in late spring, fertilize her eggs, and soon thereafter die. Altogether, a six-year-old queen could easily have produced 3 million ants.

The life cycle of ants, known as complete metamorphosis, moves from an egg stage through larval and pupal stages and, finally, to the adult stage. In some species during this time, a particular ant might shift functions. She begins her working life as a "nurse" ant, caring for the larvae, pupae, and baby ants. When she grows older, she might tend to the needs of the queen. Nurse ants regurgitate food given them by worker-forager ants; they keep this food stored in their second stomach until needed. All colonies have worker-forager ants that obtain the food and share it with the other ants. Depending on the species, this might involve raising aphids and milking them like cows; searching for seeds, insects, or sap; or even farming fungi deep within the tunnels of the ant colony. Soldier ants guard the colony, launch armies into war, and some use chemical sprays to alarm and confuse enemies. There are ant species that capture slaves from other colonies and train them to care for their young and to forage for food.



Sample Lesson: The Life Cycle of an Ant

Objectives

Through this activity, students will:

- Develop an appreciation and respect for life and living things.
- Make students aware of the responsibility of taking care of animals being kept in captivity.
- Develop an awareness that all insects, including ants, possess six legs and three body parts (head, thorax, and abdomen).
- Begin to understand the ways social insects work together and how this cooperation helps the overall colony.
- Develop an awareness that some insects, including ants, go through four changes during their life cycle (complete metamorphosis).
- Become aware of what some ants eat, where they live, and how they defend themselves.
- Grow in their development of questioning, observing, and comparing skills.

Materials

- A few live ants in plastic containers
- A picture of an ant and of an ant colony
- Materials students can create clay or paper ants, eggs, larva, and pupa
- Cardboard sections for drawing an ant city
- Magnifying glasses
- A stopwatch

Procedure

1. Begin a unit on ants by making a list of things students know and questions they have about ants. Take your class on an ant hunt or ask students to observe ants obtained commercially or otherwise. (Before going outside on an ant hunt, it is important to remind students not to harm the ants or their habitat, and to be aware that some species of ants sting and others may pinch.)

2. Ask students to observe the ants carefully and to share their observations. Encourage students to ask questions about ants and make a list of the student's inquiries. Can they identify any similarities or differences between the basic needs of ants and humans? How do ants behave in different environments? Make sure that before the unit is completed, answers have been found to all of the students' questions.

3. Let children create a miniature ant habitat, placing a single non-stinging ant into a plastic bottle or bag. Ask each child to examine the ant with a magnifying glass. Discuss the parts of an ant, including the head, thorax, abdomen, jointed legs, compound eyes, antennae, mandibles, and maxillae. To reinforce what the students are learning, they can draw a picture of their ant using a magnifying glass to notice details. When finished, students should gently return their ants to their natural habitat.

4. After observing ants firsthand, students will be fascinated with stories about ants. Dramatizations of stories provide an excellent way for children to learn factual information that they would not gain through observation alone. You may want to invent a story about a particular ant, using clay ants and a large sketch of an ant city as props in acting out that story. If you wish to paraphrase a story, consider the following one from *Biography of an Ant* by Alice Hopf. Hopf's book relates the story of the wood ant, "Formica rufa." "Rufa" tells how she began life as a tiny egg, was nurtured as a larva and pupa by nurse ants, emerged from her pupal wrappings, and soon joined the nurse ants in caring for her developing sisters and brothers. Later, Rufa learns how to forage for food, to "milk" aphids (ant cows) of their nectar, and to collect sap from broken branches. Rufa takes this food home in her second "stomach" and feeds the delicious drops to workers, nurses, and larvae in her colony. An army of red ants invades Rufa's city, carrying larvae from Rufa's colony back to their own colony and enslaving them. But after this traumatic event, life resumes in Rufa's colony.

After hearing such an exciting story, students will be ready to design their own ant cities on poster board, and to mold clay ant eggs, larvae, pupae (wrap the larvae in paper "cocoons"), and adults to populate these cities. Alternatively, the ants can be made of paper. Students will enjoy creating their own ant stories and sharing these with each other and with family members. Students learn and internalize as they teach others.

Assessment

You can know what students have learned by listening carefully to the stories they tell using their own ant cities. Notice which body parts they include in the ants they construct. Do they include ants in all four stages of the life cycle as inhabitants of their ant city? Did they sketch a food source onto their ant city? If not, where do their ants get food and water? By asking probing questions, the teacher can get a good idea of just what they learned from this unit.

Additional Activities

- Establish an ant city in the classroom any time of the year. In some countries, biological supply houses and toy stores stock ant farms. They also sell the sand to fill them, along with wheat seeds as a food source for the harvester ants. These supplies may be ordered using the coupon included with the ant farm. Because most biological supply houses are not permitted to sell ant queens, farms populated with purchased ants contain workers only. If cared for properly, such an ant city usually will last for several months.

  Alternatively, you might also try gathering your own non-stinging colony of ants by shoveling parts of an ant city onto sheets of newspaper. Place the queen, some workers, eggs, larvae, and pupae into a previously prepared ant farm.

- Encourage students to dramatize how ants move. After students have observed a trail of ants in their work. Tell students to form two lines and move toward each other across a log or wall or other narrow path. Explain that they are to simulate ant behavior, using their arms as antennae. Three children can line up and move like a single ant. Do all three right legs move forward at the same time, followed by all three left legs?

- Play an ant food-sharing game. Hide a plastic bag of tiny crackers or other suitable bite-size food and drop a trail of brightly colored yarn pieces from this hiding place back to your classroom "nest." Explain to the children that ant foragers leave a scent trail from a newly discovered food source back to the nest to enable other worker ants to find the food. Send out a couple of workers to follow the trail (which, of necessity, will be visual since humans do not have a highly developed sense of smell) and tell them they may each fetch only two crackers. One cracker is for them to eat and the second is to bring back to feed an "ant" in the nest. The "ants" with whom they share the food can be the next foragers. The final two foragers feed the Queen ant (the teacher, or another designated Queen) upon their return.

- Help students construct an ant city in the block center of your classroom. Outline ant tunnels, complete with a nursery, the Queen's room, and storage rooms for food. Bring in large boxes and create real tunnels for the students to crawl through. Alternatively, students might build a city in a sand table or outline one in the sand outside.

- Dramatize being a leaf cutter ant. Cut a two-sided giant leaf out of butcher (heavy) paper, staple the sides together, and stuff with newspaper. Let students take turns carrying it like a leaf cutter ant, reminding them that ants are amazingly strong and , if magnified to human scale, the leaf would weigh 750 pounds. Imagine picking up your living room sofa, holding it up in front of you like a parasol, and running 10 miles at 15 miles per hour!

- Design an ant nature trail. Students can pretend they are the size of ants and are exploring a new plot of ground. Stretch out a piece of string to mark the trail, and make tiny signs to identify points of interest along this trail.

- Construct a food preference experiment. Place a plate containing assorted food choices in the path of ants (try sugar, bread, apple, raisin, nuts). Which foods are eaten first? Discuss how ants use their antennae for touch, smell, and possibly for hearing.

- Identify the basic needs of ants. Observe ants behavior and how it relates to satisfying their basic needs. Remind students that every creature, from ants to people, needs water, food, shelter, and space. Can they see ways in which their ants are fulfilling these needs?

- Observe how ants behave. What happens if students blow a gentle breeze on an active ant trail? If they drop water on the trail? How do ants respond to objects which suddenly block their trail? How do ants returning to their nest respond if the entrance of the nest has been plugged with a stick? Will ants form a new trail if students drop bits of food in a line off of an existing trail? What happens if an ant from another colony is placed onto the trail of the ants under observation?

- Calculate how fast ants travel. Working in pairs, one student clocks with a stopwatch and the other traces the path of an ant for a predetermined period of time. Lay a string along the path, then measure how far the ant traveled during that period. Children can work with the teacher to figure out how fast their ant was traveling using the information they collected.

Physical Science

Batteries and Bulbs

Concepts

We all use electricity every day in many different ways without necessarily understanding much about it. Children are fascinated to experiment with electricity using safe materials.

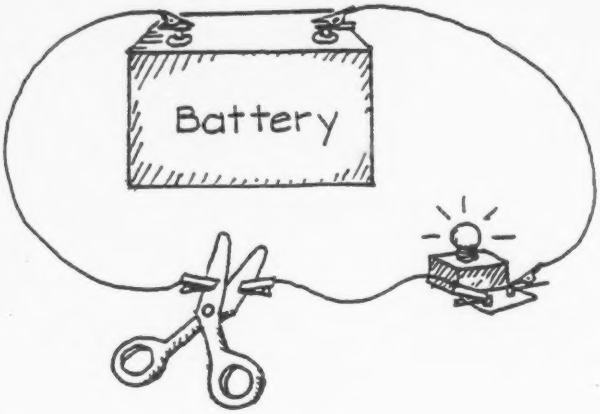
A circuit needs a source of electrical energy, a conductor of electricity, and something that puts electricity to use. A complete circuit is a series of wires and/or electrical devices that form a closed path through which electricity can flow. Children can test objects to determine whether they are conductors or insulators by placing them into a system in a manner that completes a circuit. They can then observe whether or not a lamp lights up.

Sample Lesson: Lighting a Bulb and Testing for Conductors and Insulators

Objectives

Through this activity students will:

- Learn that a circuit needs something to make electricity, something to carry the electricity, and something that uses the electricity (like a light bulb).
- Learn that electricity travels in complete closed circuits.
- Determine the properties of materials that conduct electricity.



Materials

- Batteries (either 6 volt or 1.5 volt, one per child is ideal. Test these batteries before the class begins).
- Flashlight bulbs (also test before class begins).

- Lengths of insulated copper wire with one cm. insulation stripped from each end (wires need to be at least long enough to reach from one electrode to the other of the batteries you plan to use).
- Alligator clips, sockets, wire strippers, and assorted materials in bags to test for conductivity (glass marbles, wooden sticks, paper clips, plastic lids, toothpicks).
- Paper plates or stiff paper for sorting objects. Draw an unlit bulb on one half of this paper and a lit bulb on the other half with a line down the middle that separated the two drawings.

Procedure

1. Experiment on your own before beginning the unit if you are unfamiliar with these materials.

2. Begin by asking students to discuss what they know and what they want to learn about electricity.

3. Show your students a battery and find out if they can tell you what it is and what it might do. Ask them to read from the battery the number of volts of electricity it can generate. Tell them that batteries are safe to experiment with, but that they cannot experiment with the electricity at home because it carries many times more volts of electricity than these batteries and is not safe.

4. Show the students a wire and a bulb and ask them to guess what they might do with them. Challenge them to light the bulb using only one battery and one wire.

5. Begin by letting the children explore different ways of using the materials. Tell them that when they feel the wire getting warm, they have succeeded in getting the energy from the battery but only into the wire. Point out that it is wasting energy to heat the wire, so they should unhook that set-up and try again in a different way. If they are not successful and are getting frustrated, give them hints or point out children who are on the right track. Once one child gets his or her bulb lit, the idea spreads quickly.

6. When children have succeeded, they should draw their set ups and then see if there are any other ways they can light the bulb. Keep asking questions: Is it important which part of the light bulb you touch to the wire or which part of the wire you use? Why do you think the ends of the wires are stripped of rubber?

7. When all students have successfully completed this task of lighting their bulbs, discuss the word circuit and what is required to successfully complete a circuit.

8. If alligator clips and sockets are available, the children can try to create a circuit using two alligator clips and a light bulb in a socket.

9. Next, explain to the children that some materials will conduct electricity and others will not. Those that will not are called insulators. Can children guess how you could test whether something is a conductor or insulator? (Using three wires, test in a circuit and see if the bulb lights.) Children should then sort onto the plates or paper their bags of materials, dividing them into conductors and insulators. Then ask them to see if they can develop a rule for what makes a good insulator.

10. Discuss what children have learned about circuits, conductors, and insulators. Brainstorm ways children might find answers to other questions that they have about electricity.

Assessment

Lighting of the bulb indicates successful completion of the first task. Children's drawings should show a complete circuit with wires attached to correct positions on the battery and on the bulb.

Successful completion of the second task will result in two correctly sorted piles of objects (conductors and insulators) and in the child deducing that only metals conduct electricity.

Additional Activities

This project can be extended into other realms by:

- Discussing electrical safety (never touching or playing near power lines, never using electrical appliances near water, never overloading extension cords).
- Making a list of things with the children about what they know that use batteries and/or electricity.
- Talking about ways that students imagine ways their lives would be different without electricity.
- Asking students to brainstorm ways to save electricity.
- Letting students experiment with small motors, buzzers, and switches to create fans, color wheels, and code senders.
- Letting students experiment with different numbers and types of batteries and bulbs to determine the effects on the brightness of the bulb. Often students will discover series and parallel wiring on their own.
- Experimenting with another kind of electricity: static electricity. Charge balloons by rubbing against a woolen surface and determine which materials respond to a static charge (bits of paper, Styrofoam, pepper, and even a small trickle of water will be attracted to a charged balloon).
- Dissecting a flashlight to determine how it works. Challenge the children to create their own flashlight from D cell batteries, aluminum foil, toilet paper tubes, and a bulb.
- Examining a light bulb with a magnifying glass, then creating a light bulb in a small jar, using picture frame wire and a battery to light it.
- Creating electromagnets by wrapping coils of wire around a nail and attaching the ends of the wire to a battery then exploring the relationship of electricity and magnetism.

Properties and Changes

Concepts

Life is change. Nothing ever is lost; it only assumes new forms. Some changes are man made, such as changing wool into cloth, wheat into flour, and mineral ore into metal. Some changes are natural such as plants and animals aging, dying, and their nutrients converting into soil to grow more plants that will feed more animals. Some changes are physical and some are chemical.

In order to describe change, you must first be able to accurately describe the properties of an object. Properties are qualities such as color, smell, size, and texture that may be observed using our five senses. Some properties require testing with other materials such as a magnet, an electrical circuit to test for conductivity, or water to test for absorbency or buoyancy. We also use tools such as a ruler, a balance, a thermometer, a stopwatch, and a microscope to more accurately describe properties.

Sample Lesson: Learning About Properties and Observing Changes

Objectives

Through this activity students will:

- Learn that materials and objects have properties which they can use to describe and classify them.
- Observe changes and learn that they can describe change in terms of properties that change.

Materials

- Paper bags with a collection of objects inside. (Ideally one bag per child with all bags having identical collections. Collections should include objects with similar properties such as several cylindrically shaped objects of different textures like a plastic film container, a wooden spool, and around sponge.)

Procedure

1. Play a guessing game with the children. They are not allowed to use their eyes, but only their sense of touch. The object of the game is to describe an object in their bag so well that any other student in the room can guess what they are thinking of just by hearing three clues. Ask one child to reach into his bag and choose one object to describe. All of the children have the same collection of objects in their bags, and they feel them without looking. When they think that they know what the first child is describing, they should pull that object out of their own bag and hold it up. Make sure that each child gets a turn to describe one thing.

2. As the children are characterizing the objects in their bag, help them notice that some words are very descriptive and make it easier to identify the object in hand, whereas other words are less helpful. Tell them that these clues are called "properties" and that scientists must describe the properties of things that they study very carefully so that anyone anywhere in the world will have a good idea of what they are describing. Properties are

things we can observe about an object using our five senses. We can also use tools to help us learn about the properties of an object such as a ruler, a balance, a thermometer.

3. Play a different game where you hold up one object and discover how many different properties of that object the children can describe. A child can choose one object and change a property of that object (for instance, changing the shape of a piece of paper by ripping it). Can the other students say what properties now are changed (shape and size) and what stayed the same (color, texture)?

4. Ask the children to bring in 3 objects from home or to gather objects from the playground (or you can bring in a collection of things). They can sort them into 3 groups: one they predict will definitely change over time, one they predict will definitely not change over time, and one that they are unsure about. Have them list as many properties of each object as they can think of and then place the objects into three areas of the classroom for observation (the change area, the no-change area, and the unsure area). Examine these objects frequently and record any changes that occur. Focus children's attention on which properties changed and which stayed the same. For example, a piece of bread might stay the same size and shape, but the color and texture may have changed. If you receive duplicate items, you may want to discuss with the children whether they would like to add water to one, or keep one in the dark, or put it in a warm place. Ask the children to predict and test if a change in conditions results in changes in different properties. (Be sure to caution the children to make observations with their eyes only and not to smell any moldy objects).

Assessment

Children can demonstrate their new ability to accurately and precisely describe the properties of objects.

Additional Activities

- Many kinds of changes occur during cooking. Try some of your favorite recipes with the children, noticing which properties of ingredients change and which stay the same during the process. Making ice cream, bread, gelatin, and popcorn are especially fun.

- Describe, sort, and classify button collections by many different properties.
- Ask children to clean up spills of water with different materials to test the property of absorbency.
- Study the processes that change various materials into products which we use every day such as cans, bottles, fabrics, and paper.
- Test a variety of materials to determine their property of transparency or opaqueness.
- Experiment with temperature changes to observe evaporation and freezing or melting. Use different liquids, and solids that melt, like wax and butter.
- Experiment with materials that dissolve (like sugar and salt).
- Challenge the children to predict, test, and invent a rule for the property of buoyancy.
- Demonstrate the chemical change that occurs when vinegar (or any other acid) is added to baking soda. This is dramatic and fun for children.
- Try different cleaning activities such as polishing metal and cleaning windows. These activities offer great opportunities to experience and describe changes.
- Sing the same song experimenting with changes in volume, pitch, tempo, timbre, and words.

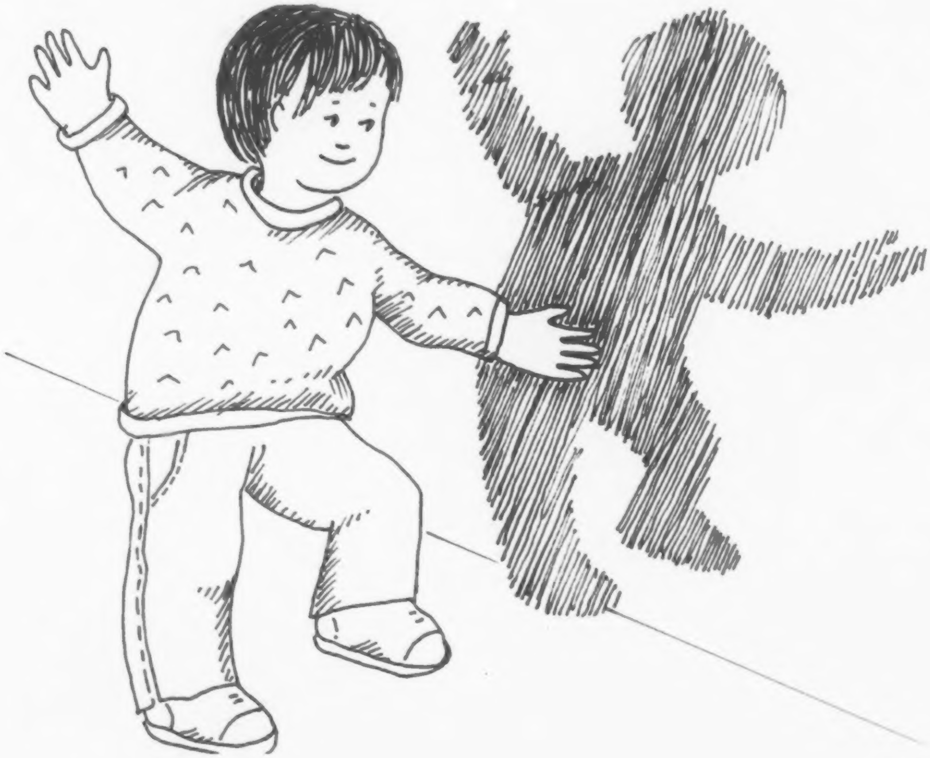
Light, Shadows, Reflections, and Color

Concepts

Light is necessary to be able to see. Light travels in a straight line unless it strikes an object, and then it may be absorbed or reflected. The source of most light that man sees is the sun, but light can also come from a light bulb, a candle or fire, something very hot, or certain animals such as fireflies and fish that glow.

A shadow is an area of darkness that is formed opposite a light source when an opaque object blocks the path of light. Light can pass through some materials better than others.

Reflections are caused by light bouncing off of any smooth surface. Mixing the three primary colors can make every color of the rainbow. Colors can be separated into primary colors.



Sample Lesson: Shadows

Objectives

Through this activity students will:

- Learn what makes a shadow-light source, an opaque object, and a surface for shadow to fall upon.
- Understand that shadows fall on the opposite side of the object from the light source.
- Discover that the nature of a shadow depends on the distance of the light source from the object and on the surface the shadow falls upon.

Materials

- Chalk
- Paper plates
- Plastic cups and water
- Two bags of mystery items that create interesting shadows (such as a key, a spoon, a bone, a hair bow, a plastic glove, a piece of lace)

Procedure

1. Begin by asking children what is a shadow. What do they know? What would they like to find out?
2. Discuss that a shadow is an area of darkness made when light is blocked by an object. Remind children that when you go outside to experiment with shadows they should never look directly at the sun. Take children outdoors, arrange them in a line along the edge of a parking lot or sidewalk. Review the rules of the game Simon Says (only do the activity when Simon says to do it). Play Simon Says by making your shadow as tall as it can be, as short as it can be, absolutely still, in front of you, behind you, on your right, on your left, as clear as it can be, or as fuzzy as it can be. Turn around. Did your shadow follow you? Step on your shadow with one foot

and then with two feet. Can you catch your shadow? Pick it up? Touch it at all? Simon says to make the most interesting, the scariest, the most graceful shadow you can.

3. Review the fact that light travels in a straight line. Because the light from the sun is blocked by your body, a shadow is made. The shadow is always on the opposite side of the object from the light. Challenge the children to work in threes to make a one-headed, six-armed monster shadow. Soon they will discover that they have to stand in a line with their backs to the sun.

4. Give each child a paper plate. Challenge them to make the largest shadow they can with it, the smallest shadow, and a not-round shadow. Review that the shape and size of a shadow depend on its position relative to the light source.

5. Encourage children to make predictions. Do they think a transparent object will make a shadow? Then give each child a plastic cup. Ask them to notice that the shadow of the cup is not as dark as the shadow of their bodies. Some may discover how to refract light into interesting patterns. Pour a little water into each cup and ask them to observe the interesting effects water shadows can create.

6. Assign the children partners. Give one partner chalk; this child is to be the tracer. The other will be a statue. Each child is asked to find a shadow pose they like and then to hold it while their tracer partner outlines their shadows on the ground. Have partners switch. Can they fit into each other's shadows? Can they determine what kind of statues the other children made based on their shadow tracings.

7. Play a guessing game. One partner is on the A team, the other is on the B team. The B partner sits down, looking away from the light source, while the A partner chooses an interesting object from the teacher's "A" bag to hold above B's head. B looks at the shadow of this object on the ground and tries to guess what it is. The A person can change the angle of the object to make guessing easier--or more difficult. Review that the position of the object will change the shape of its shadow. After B has guessed the object, A returns it to the A bag, and B chooses an object from the teacher's "B" bag. Play several rounds of this game to give children practice in examining shadows.

8. Return to the classroom and record the children's observations of what they learned about shadows and to work on ways to discover other things children wanted to know about shadows.

Assessment

At the end of this lesson, students will be able to correctly list what is needed to make a shadow.

When shown a solid object, the students will be able to draw the predicted shape of its shadow.

Additional Activities

Activities you can do to extend this lesson are:

- Play the shadow guessing game indoors with a flashlight or a lamp shining toward the wall of the classroom.
- Create a shadow hunt to look for particular types of shadows (such as a round shadow, a moving one, a fuzzy shadow, a tiny or pale shadow, or the shadow of a cloud).
- Draw shadow pictures on construction paper, on photographic paper, or on special sun-print paper.
- Trace children's shadows onto a sidewalk or a parking lot on a sunny day. Then ask the children if they think that the position of the shadows will change during the day. Return every few hours and have the children stand in same spot and trace themselves with a different color of chalk. Discuss with children what is happening and why (the position of the sun is changing in the sky as the earth moves, resulting in a shift of their shadow throughout the day).
- Create sundials on a paper plate, using an index card "gnomon" to indicate the hour (fold the index card in half diagonally and tape it onto the plate). The tip of the gnomon should point to the north. Leave the plates outdoors all day, weighted by a small rock so that they won't blow in the wind. Mark where the shadow is cast on the plate each hour.

- Play shadow tag. One person is designated "it". His shadow has to touch the shadow of another child to make that second child "it."

- Create a shadow theater in the classroom using lamp and an old bed sheet. Let the children create silhouettes of animals and other things using their hands, or cut out pictures and tape them to sticks. Perhaps the children could even write a show where they pantomime activities in the shadow theater while their classmates guess what they are doing (such as washing their hands, throwing a ball for a dog, winding up a ball of string, ballet dancing, marching like a soldier).

- Use a desk lamp to create silhouettes of children on wall. Trace onto paper and the children can cut them out. They can then try to identify silhouettes

To study light, color, and reflections, you can:

- Predict then test which materials light can pass through (pieces of newspaper, tissue paper, plastic bags, cardboard). Teach children the words transparent, translucent, and opaque. Find examples of each kind of material in the school.

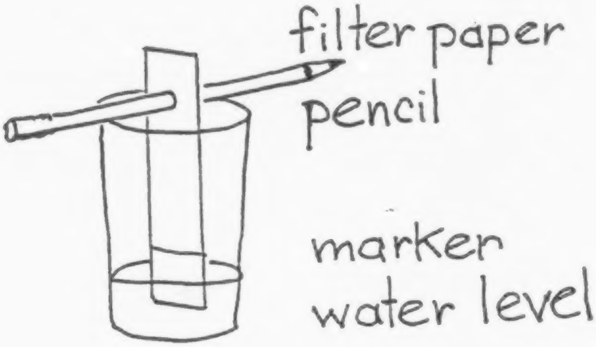
- Conduct many experiments with the children to demonstrate that light is essential for plant growth. This can be done by growing identical plants in light and darkness; or taping an opaque object onto the leaf of a plant and watching how that leaf grows; or creating a plant maze in a shoe box and watching how the plant grows towards light.

- Make a color wheel with all the colors of the rainbow on a disk of stiff paper. Do this by looping about 1 m. of string through two holes in the center of the disk. Tie off the loop. Put one end of the string over each index finger and flip the disk until the string is twisted. Pull hands apart to make the disc spin rapidly; the colors will blend into a creamy "white light," demonstrating that white light is really all the colors mixed together.

- Use a prism to show how white light can be separated into all the colors of the rainbow. Notice how the colors are always in the same sequence.

- Create a rainbow by using water from a garden hose. If children stand on one side of the spray with light at their back, the droplets should refract and reflect the light into a rainbow. Move the angle of the spray until all children have seen the rainbow.

- Give children practice with color mixing by providing them with the three primary colors (red, blue, yellow) of food coloring and water. Challenge them to mix these using droppers in Styrofoam egg cartons or ice cube trays to come up with "recipes" for every color of the rainbow. This also can be done using colored cellophane.



- Teach children how to separate colors using the process of chromatography. Use a strip of filter paper such as cut-up sections of coffee filters or paper towels. Make a mark about an inch from the bottom of the paper using a brown or black water soluble (not permanent) marker. Hang the paper in a jar of water so that the bottom of the paper touches the water, but not the ink mark. As the water moves up the paper, the colors of ink will separate into the pigments which were blended to produce the color in the marker.

- Examine colored comics and magazine pictures with magnifying glasses or microscopes to see how dots of color blend to make pictures.

- Poll classmates and teachers to determine their favorite colors and display the results in a graph.

- Collect a variety of paint chips from a paint store. Have children match the color closest to particular objects in the classroom or in nature.
- Go on a walk that focuses on a particular color (such as how many red objects can you find?).
- Examine the role of color in camouflage in nature and in combat.
- Note color changes in nature (seasonal, developmental such as aging, and under varying conditions, such as during a drought).
- Discover how many surfaces can make reflections around your school (spoons in the cafeteria, car fenders in the street, a puddle, windows, doorknobs). Have the children notice that all are smooth and shiny. Rounded or bent surfaces distort in amusing ways.
- Use mirrors to experiment with finding new images in various pictures, to solve mirror puzzles, and to find lines of symmetry in letters of the alphabet. Test vertically, horizontally and on the diagonal.
- Tape two mirrors together like a hinge to experiment with reflections of reflections.
- Use three small mirrors taped in a triangle with reflecting surfaces facing in to create a simple kaleidoscope.
- Make "human mirrors": Have one child be the real person and another be the reflection who must imitate everything the real person does, as it would appear in a mirror. Mark a line on the floor to represent the mirror and provide pairs of students with a mirror to check themselves.
- Study the moon, pointing out that the moon does not create light itself, but only reflects light from the sun. The phases of the moon are caused by the changes in angle between the earth, moon, and sun. Have children keep diaries of the moon's changes. Create a shoe box moon diorama with a flashlight sun to help children understand the moon's phases.
- Experiment with different kinds of lenses and light-reflecting devices such as magnifiers, cameras, binoculars, kaleidoscopes, and periscopes.

Earth Science

Weather

Concepts

Three major factors form our weather: heat, air, and water. The warming of the earth's atmosphere by the sun causes heated air to rise and move toward cooler regions, while heavier, cooler air takes its place. This cooler air is then warmed and rises, repeating the pattern. The earth rotates and the air follows a curved path, known as the prevailing winds. Water evaporates and accumulates in the air until it reaches a saturation point and then precipitates. Weather is everyday changes in temperature, humidity, wind speed, and precipitation. There are tools to measure each of these. Climate is the average of weather conditions over time.

Sample Lesson: Learning About Weather

Objectives

Through this activity students will learn that:

- Air is all around us; we can't see it, but we can feel it and it takes up space.
- Wind is moving air.
- Sun, wind, and water are important weather makers.
- Weather can change from day to day and season to season.
- Weather can be described by measurable quantities such as temperature, wind direction and speed, precipitation, and humidity.

Materials

- A globe or picture of our earth
- A scarf to drape over as "atmosphere"
- A bin of water
- Clear plastic cups
- Paper towels
- Corks
- Xeroxed copies of wind snake
- Thread
- Cellophane tape
- Scissors
- Markers
- A heat source like a radiator or hot plate
- Black plastic film containers
- Finishing nails with very small heads
- Hammers
- Pebbles
- 2- inch lengths of plastic straws
- Index cards cut into 2-inch triangles

Procedure

1. Begin by asking the children what is weather? What causes it? What do they know about weather and what would they like to find out? Children often have misconceptions about weather and its causes, but don't try to correct them now, just list their comments.

2. Explain that weather is changes in the air outdoors; sometimes it is cold, or hot, or rain or snow falls. Before we can learn what makes those changes, we need to learn a little about air.

   Our earth is surrounded by a blanket of air called the atmosphere. (Drape a scarf over a globe or a picture to be the "atmosphere"). Explain that this atmosphere is only about 50 miles deep and beyond that in space there is no air. Where there is no air there is no weather.

3. Ask how the children know air is there. Can they see it? No, but ask them to try blowing into an "empty" paper bag. Now can they see it? Can they feel it? Blow on their arms. Point out that even though they cannot see air, they can see when it takes up space in a bag and they can feel it move.

4. Ask: Can two things take up the same space at the same time? (No.) Does air take up space? Try putting a paper towel in the bottom of a cup, pushed in tightly so it won't fall out. Flip the cup over and push straight down into bin of water. Ask children to predict whether the paper towel will be wet or dry. Pull the cup straight out and remove the dry paper towel. It is dry because the air takes up space and the water cannot get into the cup and take up the same space.

   Try the experiment again, but this time turn the cup at an angle so that a big bubble of air escapes from the cup. Now the paper towel will be wet because when the air escapes, the water will rush in. Let each child try this activity to become convinced that air does take up space.

5. Give each child a cork and ask them to figure out how to make it go to the bottom of a bowl of water without touching it. Eventually they will discover that by placing the cup on top of it and pushing straight down the

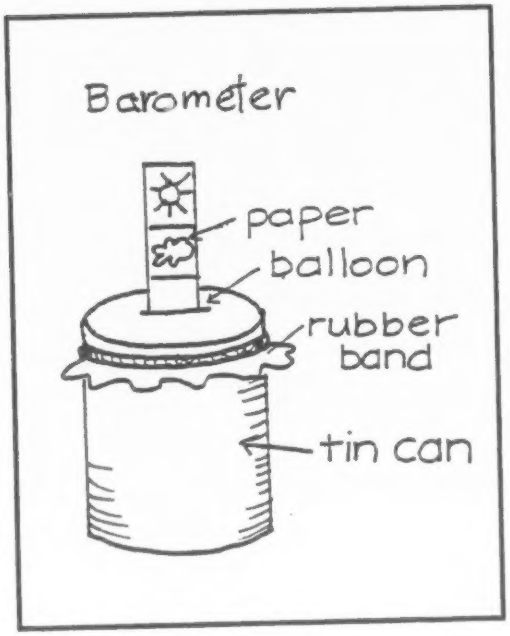
cork will go to the bottom because the air has pushed the water out of the way, and the cork cannot float on air, only water. Collect cups, corks and paper towels. Review that air is real, takes up space, you can't see it, but you can catch some in a bag and feel it.

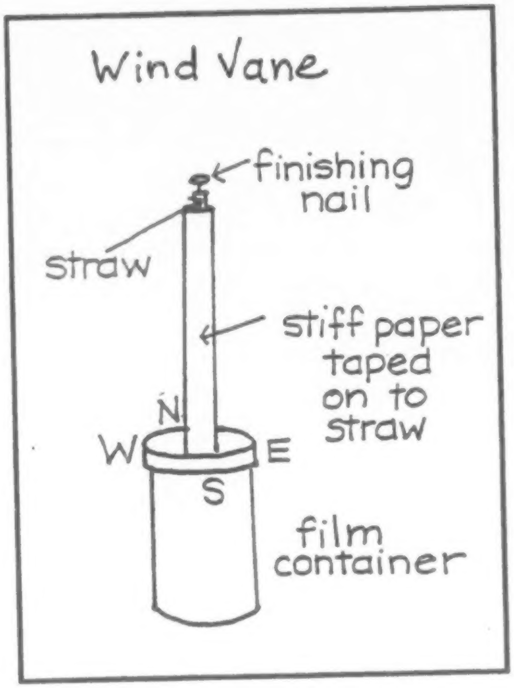
6. Ask: What happens to air that is heated? We cannot see the air, but we can see what it does to a wind snake (a paper spiral about 4 cm around, with thread attached to middle). If the wind snake is held over something hot like a radiator, what happens? (The snake moves quicker when hot is air rising.) Each child can create a wind snake and it test over a heat source like a radiator. Then take it outdoors on a hot, still day to test hot air currents over the blacktop of a playground versus over grass.

7. Explain that the sun is constantly heating air which rises and moves, being replaced by cooler air. This causes the wind, and the winds can bring different kinds of weather. Knowing the direction that the wind is coming from can help predict what kind of weather it will bring, so a weather vane that tells wind direction is an important weather instrument.

   Make your own weather vane using a film container. Each child gets a container with a lid on. Review the four points of the compass and the fact that the sun always rises in the east. Let children mark North, East, South, and West on the lid and draw a "sun" around the East to remind them that the sun always rises in the east. When they take the wind vane home, they should remember where the sun rises at their house and make sure east is pointing in that direction. Hammer a finishing nail through the center of the film container lid. Open the lid and put in some pebbles so the wind vane won't tip over. Tape the triangle-shaped piece of index card onto the straw, and slip the straw over the nail. Children can decorate this "flag" with any image they want (show them pictures of wind vanes). Test the wind vanes outdoors or in front of a fan.

8. Review what you have learned about weather. Brainstorm ways to find answers to other things children wanted to learn about weather.


Barometer
paper
balloon
rubber band
tin can


Wind Vane
finishing nail
straw
stiff paper taped on to straw
N
W
E
S
film container

Assessment

- Children can follow directions to build weather instruments.
- Children can describe some of the properties of air.
- Students can match pictures of weather instruments (thermometer, barometer, wind vane, rain gauge) with the conditions they measure.

Additional Activities

Possible extension activities you can do are:

- Make a tin-can barometer. Stretch a balloon with its neck cut off over the open end of a tin can. Secure the balloon in place with rubber bands. Tape a piece of cardboard to the side of the can, extending about 20 cm over the top of the can, and tape an indicator needle to the balloon skin so that it touches the cardboard about 10 cm. up. Mark a scale on the cardboard and watch how the indicator goes up and down each day. Air is pressing on everything, including the balloon skin. Falling pressure indicates bad weather coming while rising pressure indicates that the weather will improve. To demonstrate, place the can in ice water and then in very hot water and watch the balloon skin fall then rise as the pressure changes inside the can.

- Make a weather flower to indicate changes in humidity. Spray 10% aqueous cobalt chloride solution onto basket-type round coffee filters and let dry. Children can then wind a pipe cleaner around the filter to make a flower stem and add leaves. The flower is blue when dry and pink when moist. Try spraying the "flower" with a plant mister and then drying it with a hair dryer to demonstrate changes with humidity.

- Make a rain gauge from any flat-bottomed, straight-sided container. Mark off measurements with a permanent pen. Empty the rain gauge after each rain fall. If each child makes his own, have them record the depth of the rainwater and hypothesize as to why some gauges might have less than others (perhaps they were placed under a tree or near the edge of a building).

- Keep daily charts of weather conditions and types of clouds.

- Examine weather maps from the newspaper.

- Encourage children to see familiar shapes in the clouds and use those images in creative writings.

- Observe what can be moved by the wind. Predict and test a variety of objects under different wind conditions.

- Go on a scavenger hunt to look for signs of weather conditions (erosion from heavy rain, something left by the rain, something that tells you a strong wind came through, something shaped by wind or water).

- Every culture has its weather folklore. With the class, make a list of your weather sayings and work with the children to try to determine if there is any validity to those sayings.

- Have children collect a level cup of packed snow and predict what will happen if they bring it inside. They should mark a line on their cup indicating where they think the water level will be when the snow has melted. Observe and discuss the results, and then let the water evaporate.

- Invite a meteorologist to come to school and talk with the children about how weather is predicted.

Seed-Bearing Plants

Concepts

All plants fall into two basic categories: flowering and nonflowering. Examples of nonflowering plants are ferns, mosses, and conifers. There are over a quarter of a million species of flowering plants in the world today, and new ones are being identified daily.

Flowering plants use the energy collected from the sun (with the help of the green pigment chlorophyll), carbon dioxide, and the water and minerals which the roots have absorbed from the soil to create food in the form of sugars (a process known as photosynthesis). Respiration is the process by which the plant breathes through its leaves.

Parts of flowering plants include the fibrous roots (which anchor the plant into the ground and absorb nutrients and water from the soil); stem (the plant's transportation system); leaves (the plants food factory); buds (which become leaves or flowers); and flowers (which produce the seeds that grow into new plants).

Leaves are varied in appearance and function. In order to carry out their jobs of making food for the plant and respiration, leaves needed to adapt to their living conditions. Plants in the lower level of a forest may need large leaves to catch enough light, while plants at higher altitudes lashed by strong winds need small, tough leaves to survive.

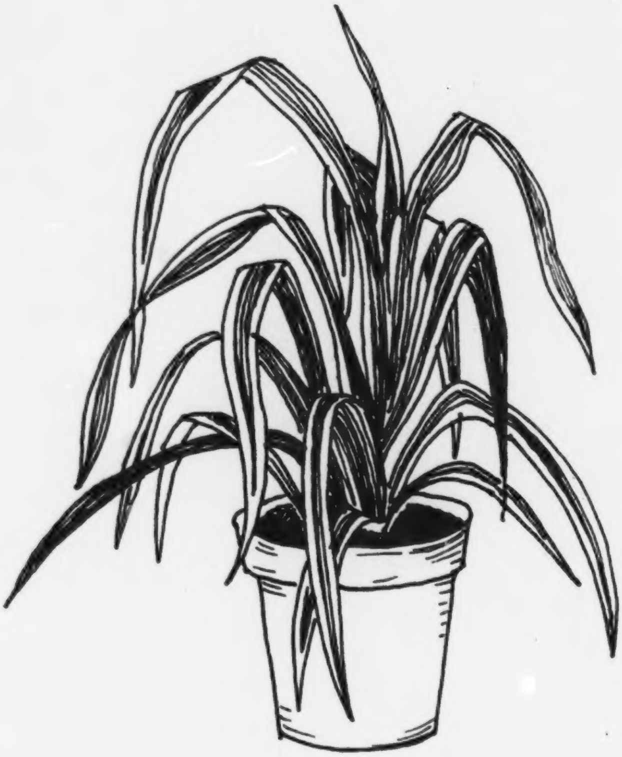
The job of the flowers is to produce seeds. This requires a process known as pollination in which pollen grains have to travel from the male to the female part of the flower. Whereas some plants are able to pollinate themselves (self-pollination), many rely on receiving pollen from another plant of the same species (cross-pollination). In some cases, wind or water help scatter the pollen, but the most important pollinators are insects. To attract these insects and enhance the transfer of the pollen, plants have evolved flowers with interesting shapes and bright colors.

The parts of a flower fall into the following three groups: the male parts (the stamens) produce the pollen; the female parts consist of the ovary, in which there is the ovule (embryo seed) and from which projects the stigma (the pollen receiver) on a stem, or style, of varying length; and around both the male and female parts are sepals and petals (which in some flowers look the same). Once a pollen grain lands on the stigma of a flower of the same species, it produces a pollen tube that grows through the stigma and down the style to fertilize the ovule. The flower petals wither and fall and the ovary starts to grow bigger as the fertilized ovules within develop into seeds. A fruit is a ripened ovary that contains one or more mature seeds.

The key to the survival of the flowering plants is for the seeds the fruit protects to be disseminated in hospitable environments. Juicy, brightly colored fruits may be readily eaten by animals and deposited in their feces far from the parent plant. Other means of seed dispersal include the wind ("flying" seeds often have wings or silky hairs), water ("floating" seeds may have tough husks and air spaces in them), hitchhiking (these seeds may have sharp hooks or barbs which stick to furry animals), and, in cases where there is little competition for space and light, the seeds might simply drop or "explode" from a fruit into the immediate vicinity.

When conditions are proper for growth, seeds undergo germination (the development of the plant embryo into a young plant). Some seeds need a resting period and some need periods of cold before they germinate. All seeds need water, oxygen, and the proper temperature before germination will occur.

During the first stage of germination of a bean seed, water enters the seed causing it to swell and the seed coat to split. A root pushes out through the seed coat. Next, root hairs and side roots develop. A short stem pushes the cotyledons (the food-storing parts of the seed used by the developing plant until it can produce its own food) above ground. Photosynthesis begins. At this time, roots and stems lengthen, leaves grow larger and open up, and the seed coat falls off. The cotyledons begin to shrivel as the stored food is used up. New leaves begin growing, the cotyledons fall off, and the seedling becomes a mature plant.



Sample Lesson: Collecting and Sprouting Seeds

Objectives

Through this activity students will:

- Understand the concept that all flowering plants make seeds, which contain the material for starting new plants.
- Understand that if seeds are planted in soil and are kept moist, are maintained within the appropriate temperature range, and receive sunlight, they have the potential to grow and become mature plants.
- Learn that each plant has its own unique seed that can only grow into the kind of plant that produced it.
- Develop an awareness that the fruit of a plant is the protective structure in which the seeds for the plant are found.
- Understand that all seeds are alike in the following two ways: First, every seed contains a little plant called an embryo, and second, all seeds contain food that helps the little plant grow.
- Learn that seeds have three parts: the seed coat, which protects the baby plant and is the part we see; the baby plant or embryo; and the stored food in the seed leaves (cotyledon).
- Develop an awareness that seed dispersal is an important process for plant survival, and it occurs in many different ways.

Materials

- Pictures of the sequential development of a flower's ovary into a fruit
- Small paper bag and egg carton for each student
- A package of large lima beans, half of which are soaked in water overnight

- Containers for planting (one per student)
- Potting soil
- Seeds for planting sprout gardens (mustard, curly cress, chives, alfalfa, radish, lettuces, and possibly basil and beans)
- Sprayers filled with water

Procedure

1. Do a seed hunt is in the fall. Begin by telling students that flowers have been busy all summer doing their job. Students can guess what the job of a flower might be, and show them pictures of the sequential development of an ovary into a fruit. Explain that fruits are "houses" for seeds; they protect the seeds until conditions are right for a new plant to grow.

2. Give students a paper bag and take them out on a seed hunt. Students can figure out where to search for seeds and, if seeds are in limited supply, specify the number of that particular type they may collect. Figure out ways the seeds are dispersed by the parent plants. After the seed hunt, encourage students to sort their seeds into egg cartons. Have them divide a piece of paper into four sections and label these "floaters," "flyers," "hitchhikers," and types that "travel with animals or people." Put an example into each of the four categories.

3. Suggest that the students create a seed story, perhaps about "Marie Mapleseed" and her encounters with "Samuel Squirrel." Marie might depart her beloved mother tree on a gust of wind, encounter "Phoebe Parachute" (a dandelion or milkweed seed) as she sails along, meet "Chris Coconut" as she floats down a river, and have a close call when the squirrel collects her and tucks her away for a future meal.

4. In a subsequent class, ask students to compare a dry lima bean with one that has soaked overnight. How are they the same? How are they different? What do they think happened to the seed as it sat in water? Have students peel the outer coat from their seed and gently pry the cotyledons apart, using a fingernail. What is inside? Does it remind the students of a particular plant part? Which one? Do they think a seed is alive? Why or why not? Why do they think seed coats are so hard? Can they draw the parts of a bean seed?

5. Allow students to grow sprouts to eat. Set up an assembly line of pre-dampened potting soil, seeds to be planted, and water sprayers. After students have put their name on a planter, have them measure and add potting soil to it and plant the designated number of seeds (a pinch of smaller seeds and 5 or 6 of the larger ones). Use the sprayer to water the newly planted seeds, cover loosely with clear plastic wrap to create a mini greenhouse, and place in a sunny window. Remove the plastic wrap each day to prevent molds from damaging the seedlings. Explain to students that botanists are scientists who study plants and that botanists keep records about things they grow. Students should keep a record using dates and sketches of the developments in their planters. When sprouts are large enough to eat, have students harvest them and enjoy on a sandwich. Alternatively, mix the sprouts in 3 tablespoons of salad oil, 1 tablespoon of vinegar, salt and pepper, and pour over a salad.

Assessment

By the end of this lesson, students should be able to:

- Sort seeds by how they disperse.
- Sketch the parts of a bean seed and tell about each part.
- Be able to name some fruits and explain how they grew on the plant.
- Keep a meaningful record of the seedling growth in their planters.
- Explain the sequence of growth from seed to plant.

Additional Activities

Activities you could do to extend this lesson are:

- Challenge the students to sort groups of seeds or leaves according to the way they look. Discuss the different properties used to sort the seeds (size, shape, color, texture).

- Play a seed or leaf memory game. A group of students carefully observes a collection of seeds or leaves, then covers their eyes as one seed or leaf is removed from the group. Students try to recall and describe the missing seed or leaf. Whoever does this correctly, gets to remove the next seed (leaf).

In another game, divide the class into small groups and give each a group of seeds. One student in each group describes a particular seed, and whoever successfully guesses which seed is being described becomes the next person to choose and describe a seed. This can also be done with leaves.

- Ask students to pry open the different stages of ovary growth from freshly opened flowers to dead flowers to flowers with swollen fruits on them. Can they sketch this sequence?

- Grow a root garden in a container of sand or gravel . "Plant" a beet top, carrot top, parsnip top, radish, sweet potato, or onion and add water to cover the lower half of the root only. Keep the water level high enough to reach the roots of the growing plants. Which grows the fastest? Which grows the tallest?

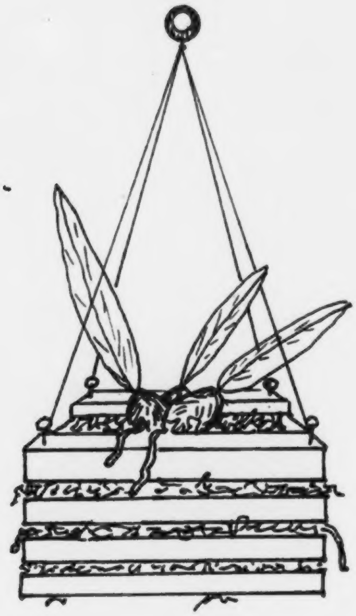
- Compare flowers from different plants. Review the parts of a flower and how flowers are alike. Then make a list of ways the students say the flowers differ (color, smell, size, feel, variations in petals and sepals [daffodil sepals, for example, are the same color as the petals, and may easily be mistaken for petals]).

- Ask students to rub or shake pollen from several types of flowers onto different sheets of black paper. Examine these pollens with a magnifying glass to see if they are all alike.

- Explore the life cycle of the dandelion or of another common regional flowering plant. Students can hunt for the various stages in the life cycle of the plant and bring these into class where they can sequence and sketch the life cycle. Explain that even though the dandelion gives the appearance that it is only one flower, it is actually a compound (composite) flower. Tear off a petal and show students the tiny flower attached to it. A single dandelion is made up of around one hundred flowers. The class can research the historical uses of the various parts of the dandelion.

- Plan a leaf hunt. Sketch or trace leaves from neighboring trees on a sheet of paper. Divide the class into teams and let them try to locate all the leaves pictured. Warn students if there are leaves in the vicinity that are unsafe to touch such as poison ivy.

- Compare leaves from evergreen trees with deciduous leaves (leaves that fall off the trees in the fall). Notice how tough evergreen leaves must be, some having waxy or furry down on them, to help them survive in winter. Talk about other leaf adaptations.



List of Materials Useful in Teaching Science

Useful Classrooms Materials Related for Science

balls
chalk
clay
crayons
cups (plastic and paper)
cups (measuring)
detergent (liquid)
glue
markers
meter sticks
paper (writing, drawing, graph, construction)
paper bags (lunch size)
paper clips
paper towels
pencils
plastic bags (sandwich size and gallon size)
scissors
string
tape (cellophane, masking, duct)
thumbtacks
tongue depressors
toothpicks

Science-Related Equipment

baking soda
balances
balloons
batteries
bins (rubber and plastic)
bulbs
colored cellophane
droppers
filter paper
flashlight
food coloring
identification guides for insects, trees, plants, birds, rocks etc.
magnets
magnifying cubes ("bug boxes")
magnifying glasses (x/6x)
marbles
mirrors (metal or plastic)
plants
plant mister (sprayer)
potting soil
prisms
rock samples
salt
shells
seeds
spoons
straws
sugar
vinegar
wire (copper insulated)

Materials to Collect From Home and Community

cloth scraps
coffee cans
corks
egg cartons
empty tin cans
film containers
jars
magazines
shirt cardboard
shoe boxes
soda bottles (plastic)
yogurt containers

Wish List of Materials to Purchase for Science Program.

aquarium
alligator clips
classroom animals (guinea pigs/hamsters/gerbils and cages)
dip net
fish for aquarium and related supplies
microscopes (30x)
stopwatches
thermometers

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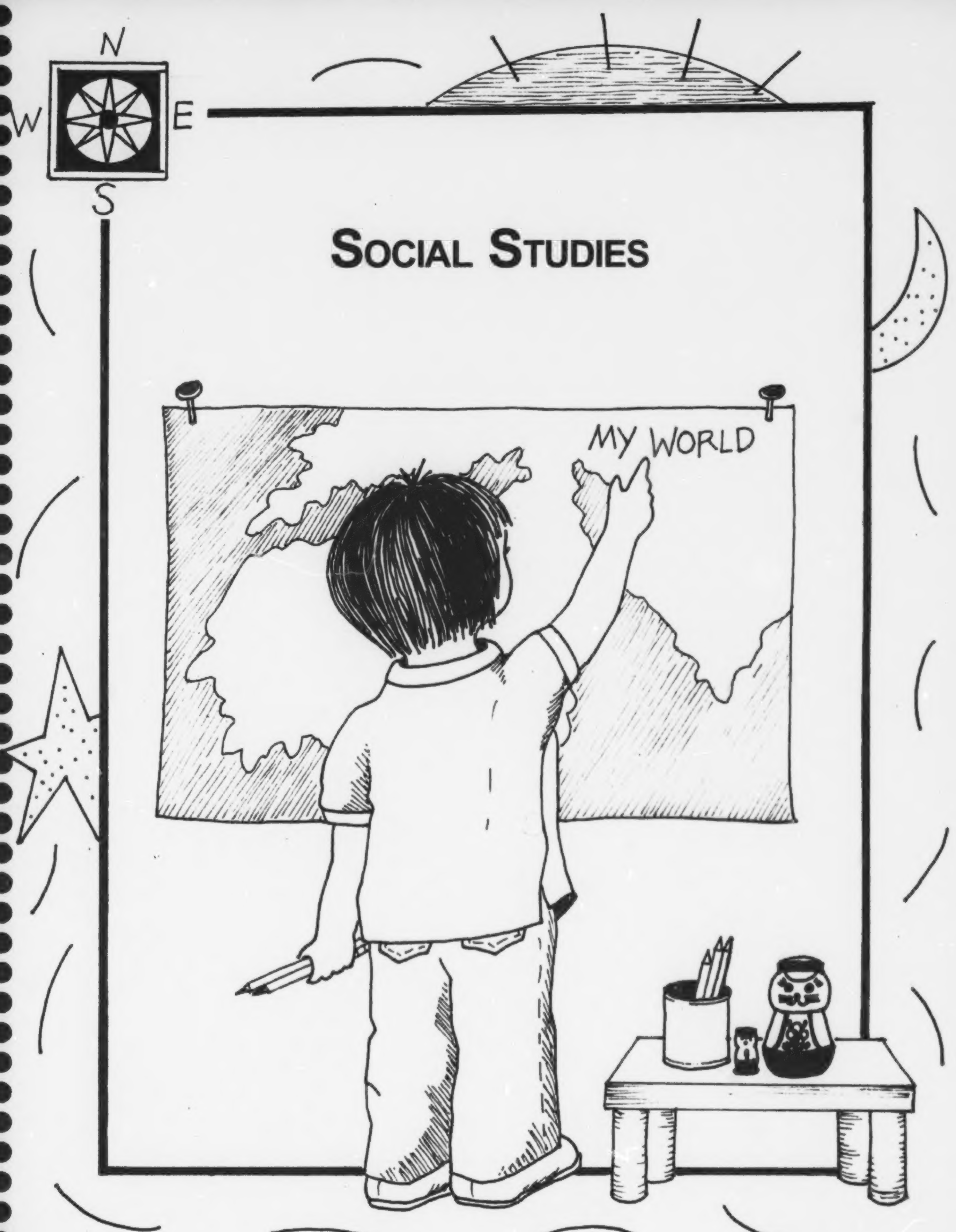
Doris, E. (1991). *Doing what scientists do: Children learn to investigate their world.* Portsmouth, NH: Heinemann Books and Northeast Foundation for Children. Available through Northeast Foundation for Children, Greenfield, MA.

SOCIAL STUDIES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MY WORLD

XIII. SOCIAL STUDIES

Overview

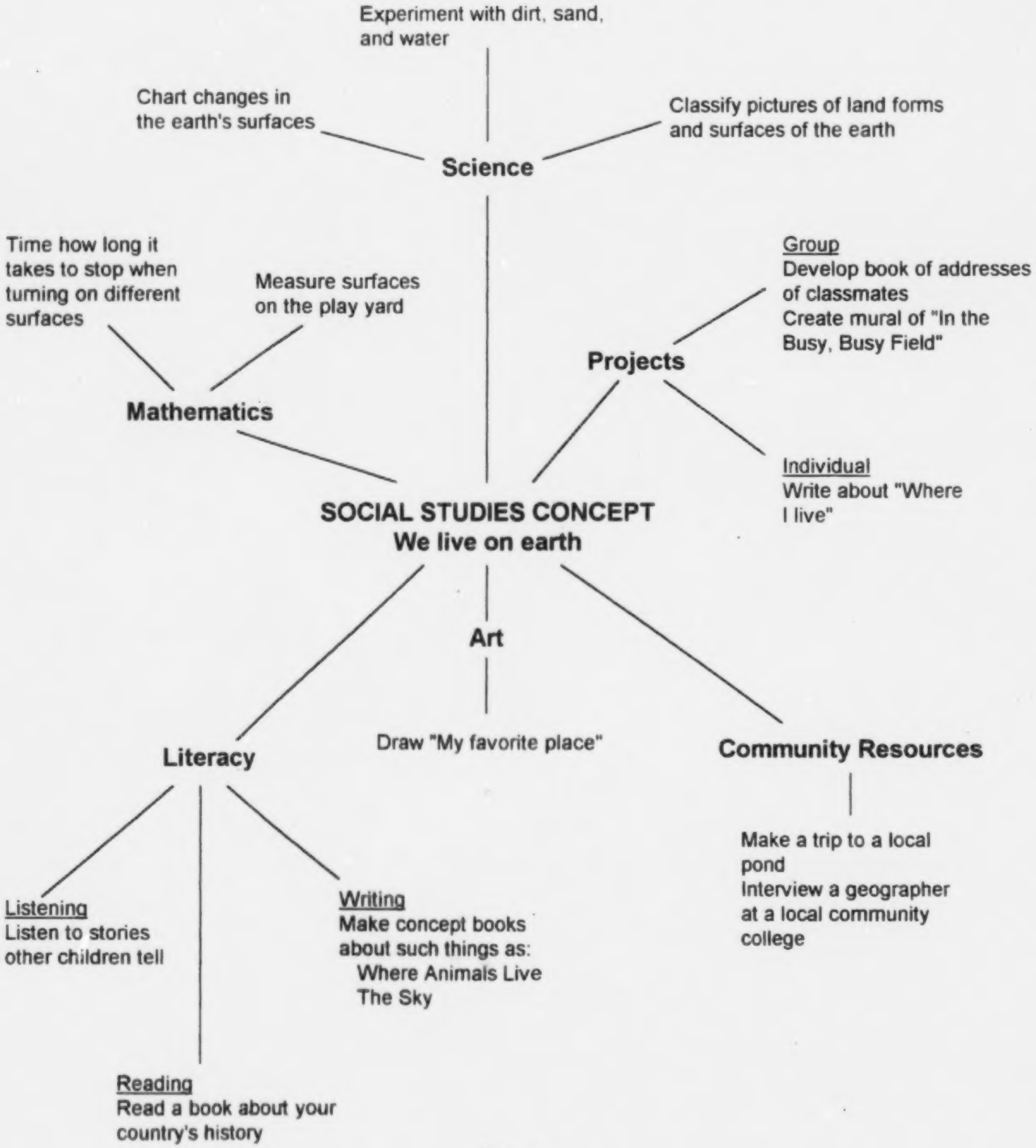
> *Designed to equip children with the knowledge and understanding of the past necessary to cope with the present and plan for the future, social studies enable children to understand and participate effectively in their world and to explain their relationships to other people and to social, economic, and political institutions.*
>
> National Council for the Social Studies, (1989, p. 15.)

This broad and all-encompassing definition of social studies illustrates the potential of these disciplines to connect the various realms of the Step by Step early childhood curriculum.

Because of the breadth of social studies, this chapter will describe children's understanding of concepts considered key in only two areas: history and geography. Yet since knowledge of history and geography alone cannot prepare children to become productive members of a democracy, the last section of this chapter will be devoted to citizenship in a democracy.

See Box 1, Social Studies: The Integrative Discipline.

Box 1
Social Studies
The Integrative Discipline



Experiment with dirt, sand, and water

Chart changes in the earth's surfaces

Classify pictures of land forms and surfaces of the earth

Science

Time how long it takes to stop when turning on different surfaces

Measure surfaces on the play yard

Mathematics

Projects

Group
Develop book of addresses of classmates
Create mural of "In the Busy, Busy Field"

Individual
Write about "Where I live"

SOCIAL STUDIES CONCEPT
We live on earth

Art

Draw "My favorite place"

Literacy

Listening
Listen to stories other children tell

Writing
Make concept books about such things as:
Where Animals Live
The Sky

Reading
Read a book about your country's history

Community Resources

Make a trip to a local pond
Interview a geographer at a local community college

History

History is of great interest to children. Who hasn't heard a child ask for "just one more story about the olden days when I was really, really little." Knowledge of history has been called "the precondition of political intelligence. Without history, a society shares no common memory of where it has been, of what its core values are, or of what decisions of the past account for present circumstances" (NCH, 1994, p. 1). Without history, there can be no sensible inquiry into the issues facing current society nor can there be effective understanding of ways to participate in the democratic processes of governance.

History is a time-oriented discipline that deals with abstract and complicated concepts of : (1) time, (2) change, (3) the past, and (4) the continuity of life. These are concepts that demand the ability to think abstractly, which children often do not accomplish until adolescence. By beginning with what six- and seven-year olds already understand of these concepts, teachers have a foundation on which to plan meaningful learning experiences.

Box 2
Concepts Key to History

Time	The study of history is time oriented.
Change	As time passes, change occurs.
Continuity of Life	Even though things change, there is continuity to the human experience.

Time

Before the age of seven or eight, children's concept of time is embryonic. Children this age understand time primarily as they experience the daily, cyclical, recurring, and sequential events of their lives. When adults use time words in connection with these events, labeling them "today," "tomorrow," "next," "in two hours," children learn to clarify and extend their embryonic concepts.

Box 3

Development of Time Concepts

Sensory - Motor **Ages 0 - 2**	**Pre-operational** **Ages 2 - 6/7**	**Concrete** **Ages 6/7 - 10**
Observes, follows routines By age 6 is aware of day and night Notices his/her environment	Ideas of time are personal and subjective Measures time with arbitrary units By age 5 has some understanding of time units such as a day Recalls past, plans, for future By age 5, can sequence events of a day and use time words	Utilizes clocks/watches to tell time Is ready for instruction in time concepts (Conventional time concepts will not develop until formal operational period—age 12+)

The names of the months and days of the week are a form of social knowledge; they are simply told to children. Children learn these as they do any other form of social knowledge, through living in the culture. Just as they learn that the word “chair" refers to the object they sit on, or the word “happy" to represent how they feel, they learn Sunday, Monday and the names of the months. It is a waste of time to spend 20 or more minutes a day reciting the names of the days of the week or the months or memorizing which day comes before or after another.

Although primary-aged children will not yet have internalized the concept of duration of an interval such as an hour or minute, they do understand that these terms have meaning (Elkind, 1981). Using these terms enables six- and seven-year olds to begin to associate their regular daily routines and schedules with clock time. By eight years of age, children usually have developed concepts of an hour, half-hour, and quarter-hour through this natural association of regular activities with clock time.

By placing clocks, watches, timers, and calendars in the dramatic play area of the first-grade classroom, children play at measuring time. Children might even begin to record the passage of time. Using a stop watch or timer, they could record how long they can hop on one foot or how many times they can bounce a ball during a minute. The stop watches and timers do not have to be accurate, the idea is only to introduce children to time words and to the idea of keeping time.

Change

With the passage of time, change occurs. To children under the age of eight who have limited ability to logically conceive time, changes that occur with the passage of time can appear as magical and unrelated to the logic of any other changes they experience. Without the cognitive ability to comprehend change, children can be unsure of the constancy and continuity of their own lives. They do not even understand the changes that occur with illness or death. A first or second grader's sense of change is indeed primitive, "She got sick because she was bad."

As children reflect on the changes that occur in their own lives, their school, and community, they begin to understand that change is continuous, always present, and affects people in different ways. Six-year olds lose teeth, all grow out of their clothing, children may move, and other children may enter the group.

Walking field trips through the school or community can be taken to observe other changes: schools may be readied for winter, or summer; around the school, streets may be repaired or a shop might close; and trees may either bud or drop leaves. One primary class observed the changes in a tree outside of its school. Throughout the year, the children recorded these changes in drawings, paintings, and writings.

Books supporting children's ability to associate the passage of time with external events, such as *The Apple Tree* (Parnell, 1987) or *The Tree* (Carick, 1971) can be read, or children can write their own stories.

Box 4
Experience with Time in the Soros Integrated Curriculum

CONTENT AREA	TIME ACTIVITY
Literacy	Read
	Write books about "My Day" and "At Night"
	Read and follow recipes when cooking
	Tell stories about past events
Mathematics	Measure cooking ingredients
	Count how long can hop on one foot using a stop watch
	Count/record days until a special event
	Using timer, count baking/cooking time
Art	Illustrate books of day/night
	Make placemats for party - eating the food cooked by groups
Science	Use stop watch to time races, jumping, walking, hopping, or running

Even though they are interested in the changes in their school and environment, children's greatest interest is in the changes that occur in themselves and their families. The birth of a baby in one child's family can lead to a unit on growth and change. When the baby is brought to school for children to observe, the children can begin comparing that baby with themselves and speculating about what they were like when they were infants. One teacher faced with a baby's visit, brought some baby clothes to school as well as some books about growth and change. Discussions took place between the children as they tried to put on the tiny sweater or measured the baby shoes with their own. Later, the children created a mural depicting what they had done when they were one, two, three, four, and five years of age. This activity was followed with other discussions about how they would continue to change. A group of teenagers was then asked to visit the class and tell what life was like for them. This visit led to the children speculating about what the future would hold for them, guessing what they would like to wear when they became teens, counting how many years it will take for them to reach the teen years, and speculating about what they think they will miss about being six or seven years olds when they are teenagers.

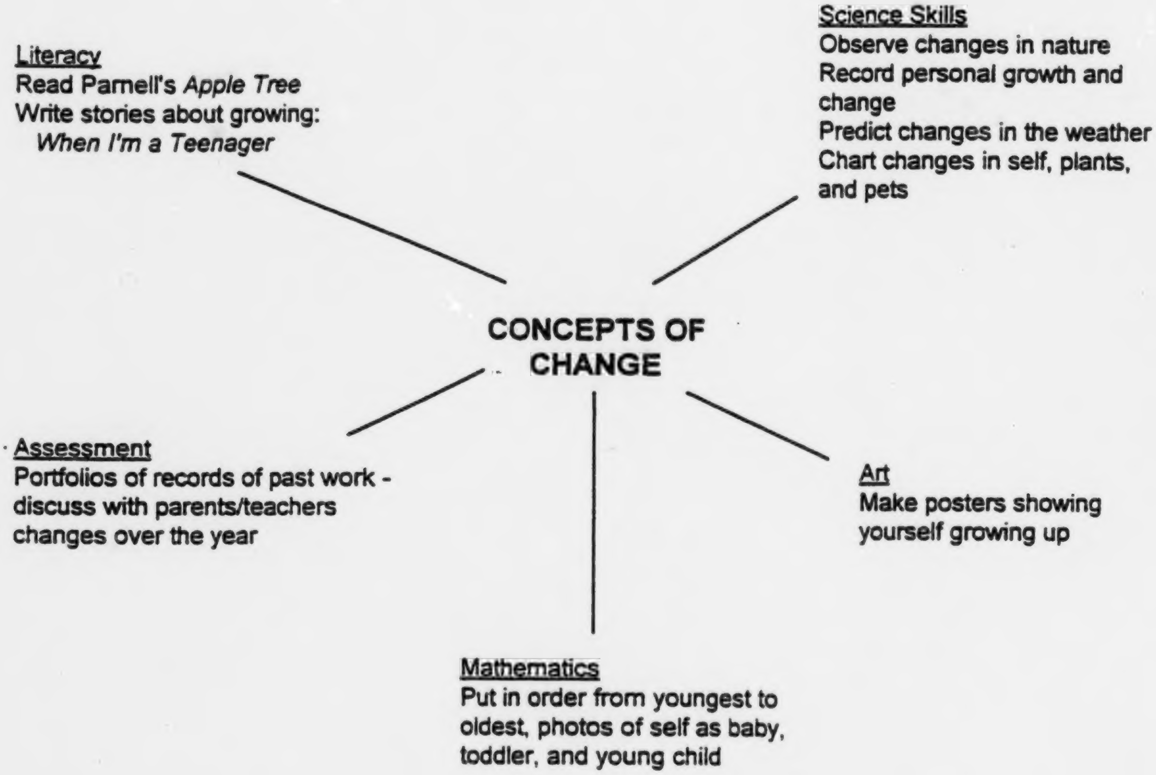
People in all cultures keep records of the past, recording events and their lives in stories and books. Well-chosen biographies and engaging accounts of history can bring meaningful awareness of the past to first and second graders.

Reading stories of children long ago or far away requires that children develop the ability to describe the past in its own terms: through the eyes and experiences of those who were there.

Families have their own stories of the past. Children in the primary grades can develop questions, conduct interviews, and put together photos and other records from their family's past. After their research, they might present a family through a picture time line, a drawing of their family tree, a written story, or an oral presentation.

Artifacts of the past can be displayed and handled. One child's grandmother brought to class an egg beater her mother had used. The children compared this egg beater with current hand-held egg beaters, an egg whip, and then an electric egg beater. As they did this, they predicted how long it would take to whip eggs with each beater, they recorded how much time each beater actually took to whip eggs, and they analyzed the differences between their predictions and reality.

Box 5
Change in the Integrated Curriculum



CONCEPTS OF CHANGE

Literacy
Read Parnell's *Apple Tree*
Write stories about growing:
When I'm a Teenager

Science Skills
Observe changes in nature
Record personal growth and change
Predict changes in the weather
Chart changes in self, plants, and pets

Assessment
Portfolios of records of past work - discuss with parents/teachers changes over the year

Art
Make posters showing yourself growing up

Mathematics
Put in order from youngest to oldest, photos of self as baby, toddler, and young child

The most interesting study of the past, however, is studying the children's own lives. A history book of each child, with photos, samples of their work, and pictures they've drawn can be created. Teachers, children, and parents can add notes recording special things that happened during the year. In the United States, these history books (or portfolios) which are highly prized by the children, become the basis for evaluating the progress of the student.

Group history books can also be made. At the end of the school year, each class can create its own history book with each child contributing a picture and story about their favorite memory in school and, possibly, a description of those things they can do now that they could not when they began the grade. The pages of this class "history" can be duplicated so that each child takes home an individual copy of *Our First Year in Primary School*.

Timelines can be created. One class began a timeline of its year in school. Each week, children took turns recording the special events that had occurred. Children's birthdays, holidays, the death of a pet, the first snow, the first day of spring, and other events were recorded. The timeline was hung in the classroom and throughout the year children were observed talking together, recalling their immediate past.

Continuity of Life

Regardless of how much things change, there is continuity in the human experience. The security that comes from understanding that life has continuity can be conveyed through interaction with elders. By interacting with older persons, children experience the fact that, although life changes, it is connected and goes on (Seefeldt & Warman, 1993).

Older volunteers in the classroom might share some of the games they played as children. In one class, an elder volunteer demonstrated card and dice games she played as a child. The children in turn, showed her how they played a new popular game.

Poetry, literature and songs all help convey the continuity of life. Singing the songs of your nation and listening to stories of the history of your country bring about feelings of pride in yourself and your culture.

Methods of the Historian

Based on the idea that children's study of history involves much more than a passive absorption of facts, names, dates, and places, each experience children have with time, change, and the past can be used to foster children's thinking skills. Throughout their days in class and at home, children can be asked to listen, observe, collect information, investigate, compare, interview, and draw upon poetry, stories, and literature in order to gain the skills of the historian: 1) identifying a problem, 2) collecting information, 3) observing data, 4) analyzing information, and 5) reaching conclusions.

Identifying a Problem

Is there a problem? One that is real to the children? Perhaps the "problem" takes the form of a question: "Was I ever as little as that baby?" or "Will I ever be as old as that man?" Or a problem can be structured by the teacher who asks, "How many minutes can you keep the kite in the sky?" Other problems arise spontaneously from classroom events or in the school, home, and community.

Gathering Information

To solve a problem, children must collect information. They might listen to an elder talk about their own childhood, examine relics or traces from the past in their homes or community, or observe people interacting. Reference books, text books, pictures, films, and other materials can be used to answer the problem. Experts might be consulted and asked to visit the class to tell children about their work or lives, and museums can be visited.

Observing Data

Collected information can be systematically observed. Ask children to describe what they see, how it feels, what they heard or read.

Analyzing Information

Once children have collected and observed information, they will need to analyze it in some way. They might record their observations in charts, drawings, or stories, they might create murals or books as a way to categorize and classify this information so that they can then compare, contrast, and analyze it.

Drawing Conclusions

"What is the answer to the question you've asked?" "What do you think?" The end of the thinking process is reaching conclusion. It must be remembered that because historians base conclusions on traces from the past, not all of their ideas are accurate. There is a lot of inference; a lot is unknown. Thus, children's conclusions, too, will not always be accurate or complete. The point is develop the habit of thinking, not to reach completely accurate conclusions.

Geography

Geography is not the study of facts about land masses, continents, and oceans. Nor is it characterized by locating rivers and mountains on a map. Rather it is a study that aims at bringing about a rich understanding of and appreciation for the physical and cultural environment in which we live. Knowledge of geography provides a sense of place and relationship in time to both historical and current events.

The study of geography begins unofficially shortly after birth when infants first explore and experiment with the qualities of things in their immediate environment. As they first crawl and then walk, they are feeling out the shape and nature of the world immediately around them.

Children's study of geography is like that of the social scientist. Six and seven year olds are like geographers. They use all of the skills of the geographer as they study: 1) the nature of the earth on which we live, 2) direction, 3) location, and 4) using maps. First, they ask questions, identifying a problem: "What?" "What is this?" Then they ask: "Why? Why is it this way?" Finally, they ask: "How? How was the bridge built? What caused this shape?" In this last stage in questioning, speculation occurs: "Does corn always grow in this field?"

Children collect information either through their explorations and experiments with their immediate world or through reference materials such as books, videos, or texts. Sometimes they gather information y interviewing experts. This information is then organized: maps are drawn, graphs created, displays constructed, and stories told. Connections between bits of information that have been collected are made, relationships are discovered, and answers to questions found.

Box 6
Concepts Key to Geography

The earth is the place we live. It is covered with different surfaces. Humans and nature change the surface of the earth.

Direction and location are important elements of geography. Maps can be used to orient oneself in space.

Earth: The Place We Live

The concept of our earth as a nearly round sphere that is part of the solar system is a concept well beyond the capabilities of seven- and eight-year-old children. Nor can children under the age of eleven and twelve accurately understand the fact that the earth rotates and revolves around the sun (Piaget, 1965).

Six- and seven-year-old children can develop embryonic understandings of the earth on which they live through first-hand trips into their neighborhood and community. Walking field trips can be taken weekly to explore different surfaces of the earth and to observe how humans change the earth on which they live. After such explorations, art activities are an excellent way of recording and interpreting what the children have seen. They might create murals to represent their experiences. One teacher gave a group of children the task of painting the bottom of a large sheet of paper green to represent the earth and the top blue for the sky. Each of the children then drew, cut, and pasted something they had observed that lived on the earth or in the sky. They added birds, houses, planes, the sun, moon, and stars, cows, and trees as they categorized life as they saw it in these realms.

Young children can identify the physical features of the places in which they live. Following a map (perhaps one drawn by the teacher) children can take a walk through their community to identify land forms. They might walk to a hill, field, or river in order to observe and chart the characteristics of that land. Even if there are no prominent land forms around their neighborhood, walks can be taken to identify and then categorize the surfaces of the earth. Which are hard or smooth? Which are soft? Wet? Which surfaces are made by humans? Which are natural? How do your feet feel when walking on sand, concrete, gravel, or grass?

Back in the classroom, additional information about the physical characteristics of the land forms around the children's community can be obtained through reference books, film stirps, or photographs. Children can compare a river they observed with pictures of rivers far from them. Reference materials carefully selected to match children's interests and needs can also expose children to other far-away land forms.

Direction and Location

Studies suggest that even eight- and nine-year olds still cannot accurately identify left and right, and it will not be until after age 12 that an adequate understanding of cardinal directions develop. Relative directions develop slowly as well; second and third graders can still be confused about relative directions. (They do not understand that a person facing them will raise the opposite hand that they themselves would raise when asked to raise their right hand.)

Physical experiences such as playing games, climbing jungle gyms, swinging, and jumping are necessary before children will be able to develop concepts of left and right as well as cardinal directions. Building with blocks and constructing edifices with other materials can be helpful as children learn about space and directions.

Concepts of location can be developed through children's attachment to place. Places, such as their home, the store they shop at, and their school, hold personal meaning for children. Beginning with trips to these meaningful places, concepts of location are fostered. While on excursions through the community, teachers point out street signs, refer to the location of the school in relation to where they are and where they are going, and use the vocabulary of direction. Young children can follow a simple map, although they are not expected to understand mapping concepts such as perspective or scale; at this age they mostly understand the idea that maps help humans locate places on the earth.

Using Maps

Under age 10 or 11, children cannot master all the abstract and concepts skills involved in map reading. Concepts of representation, symbolization, orientation, scale, and perspective do not fully develop until children are older. Nevertheless, when maps are used during walking field trips or in the classroom, six- and seven-year olds grasp the basic, elementary concepts involved. These elementary concepts become the base on which these children, when adolescents, will build their more complex understanding of the abstract concepts involved in maps.

Small maps might be placed in dramatic play areas or used in outdoor play as children pretend to take trips while riding bikes or playing with wheel toys. In the classroom, other play with maps can take place. Maps placed in the block area seem to stimulate children to re-create their world with blocks. Brown and blue strips of paper can lead children to building block structures around streets or rivers.

Six- and seven-year olds enjoy creating maps of their classroom or their home. They can draw furniture or cut out objects to represent furniture, placing them on a map. And they enjoy finding a special treasure hidden in their room or play yard by following a map.

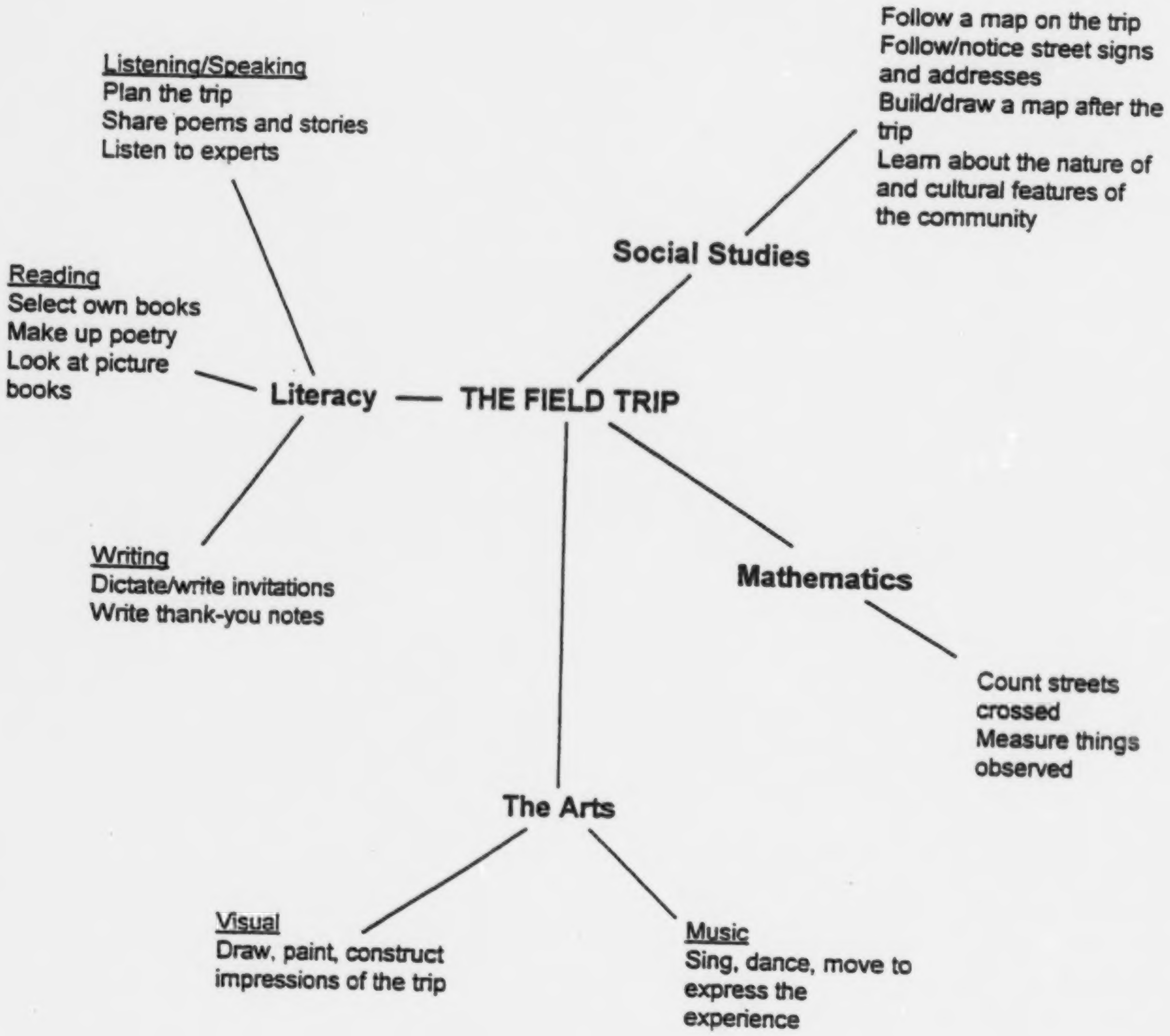
Once familiar with maps, children begin to make them, organizing information they've acquired through their explorations. In fact, it may be that children will build, draw, or paint maps well before they are able to read them.

Box 7

Geography Skills at Developmental Stages

Sensory - Motor Ages 0 - 2	Pre-operational Ages 2 - 6/7	Concrete Ages 6/7 - 10
Attends to qualities of things (self, earth, sky)	Orients self in a given space (like in a room)	8+, still having difficulty with left and right
Moves in space	Represents the world in building and drawing	Still confuses about relating directions
	Draws rough maps and can find treasures with a simple map	12+, understands cardinal directions
	Begins orientation to distance	

Box 8
Geography - The Integrative Power of a Field Trip



THE FIELD TRIP

Literacy

Listening/Speaking
Plan the trip
Share poems and stories
Listen to experts

Reading
Select own books
Make up poetry
Look at picture books

Writing
Dictate/write invitations
Write thank-you notes

Social Studies

Follow a map on the trip
Follow/notice street signs and addresses
Build/draw a map after the trip
Learn about the nature of and cultural features of the community

Mathematics

Count streets crossed
Measure things observed

The Arts

Visual
Draw, paint, construct impressions of the trip

Music
Sing, dance, move to express the experience

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Participation and Citizenship

At the same time as children's embryonic concepts of geography and history are being clarified and expanded, children are also developing the dispositions and skills they need to be citizens in a democracy. Civics education is based on the basic principles of living in a democratic society. These principles are rooted in the ideas that becoming a productive member of a democracy requires: 1) a willingness to participate in improving the quality of life in their community, nation, and world; 2) the ability to respect the perspective of others; and 3) knowing the mechanics of rule setting, voting, and balancing personal interests with the good of the group.

Willingness to Participate

When a child feels valued and respected, he or she, in turn, is able to respect and value others. Within the democracy of a group in the classroom, there are daily opportunities for young children to demonstrate respect for themselves and others. Daily, they are expected and taught to assume responsibility for themselves and for others.

In the classroom there are opportunities to lead and to follow, to select leaders, to vote, to resolve conflicts, and to participate to the fullest extent possible in the workings of the group. Dissenting voices, even though they may be in the minority, can be accepted and respected. Because respect for the individual is basic to life in a democracy, there cannot be recrimination or denigration of children for their competencies. The individuality of each child's level of maturity is respected.

Participating in a group begins with the expectation that children will care for themselves. The room is arranged so children can select their own materials and clean up after themselves. Shelves and areas with paper supplies, drawing tools, blank books, blocks, books, puzzles, and paints are arranged in ways that permit children to assume the responsibility not just of selecting their own materials, but for conserving and caring for them as well.

Box 9
Concepts Key to Participating in a Democracy

Willingness to participate.

Taking the perspective of others.

Learning to set and keep rules and to vote.

Taking the Perspective of Others

Social studies experiences offer children the opportunity to learn that others have a unique perspective on the world, one that may differ from their own. As they build an airport out of blocks, talk and discuss time lines they've made, or read their personal history books to one another, they can not help but consider the perspectives of the other children.

Group experiences, like a field trip, result in ideas, thoughts, and feelings. These are individual to each child and are expressed in their drawings, paintings, constructions, songs, dances, or stories. Teachers encourage children to share these expressions, regardless of their form with the group. It is here, as each child's unique perception of the same event or experience is made public, that children learn that others have ideas, reactions, and views that differ from their own.

One class took a trip to a fire station. The next day they painted, constructed, and wrote about their perceptions of this experience. When they were finished, they shared what they had made with the group. One group of girls constructed a quite accurate fire truck from boxes, pieces of rope, and other materials. Fred, however, painted a piece of paper red—over and over and over. When he shared his red painting with the group, the girls who had made the truck chided him, "That's not a picture of the fire station," they said. "It's only a piece of red paper." Fred responded, "No! This IS a picture of the fire station. It's red, just like the station. Everything there was red: the truck, the fire hats, the fire fighter's coats. Everything was red."

It is experiences like this that lead children to the recognition that perspectives, although they differ, have validity. Diversity of thought enhances life and deserves respect.

Mechanics of Rule Setting and Voting

As children move through the primary grades, they will assume at least partial responsibility for setting rules that affect the total school. This begins when basic rules are enforced, "No running down the steps." "Keep your spaces clean." "Help others."

Six- and seven-year-old children can establish rules for their group. One teacher, after a particularly aggressive argument between two children, initiated the idea that the group would establish rules for itself. She said, "This was a mess. We can't live like this. What should we do?" The children listed numerous rules for behavior, too many to enforce. After the list was completed, the teacher classified the rules into several groups—interaction with others, care of materials and equipment, and work habits. These were read back to the group, discussed, revised, and then listed on a chart called "Our Rules." Throughout that year when problems arose, the children would refer each other to this list of rules. "Don't forget," they would say to each other, "Our rules say you should share."

At the same time that children set rules for the group, the concept of voting can be introduced. (Voting can be explained as a way of making choices for a group.) At first, teachers may ask children to vote in ways that permit everyone to win. She might ask children to select one of two games to play, and then let children play the game they selected, having two games going on at once. Or children might vote to have vanilla or chocolate pudding for snack, with each being able to have the type they voted for.

After children are familiar and comfortable with the idea of voting, perhaps by the first year in primary school, teachers can introduce the concept of "majority" and of "winning." Again, the teacher, recognizing that children are too young to understand or accept loss, selects safe things for the group to vote on. For example, one teacher asked children to vote for names to give the two guinea pigs in the classroom. Children first nominated names, then votes were taken and recorded, and the names with the most votes were given to the pigs.

Slightly older children, eight- and nine-year olds, might vote on which field trip to take, who will ask questions of the fire fighter while on the trip to the fire station, who will present a visitor with a thank-you gift from the class, or who will represent their class in the school assembly. Even so, the teacher continues to be in control, making certain that each child in the class is able to receive the votes of all at one time or another. To achieve this, the teacher might say, "Today we need two representatives to meet with the director, you may vote for Sergia, Natalia or Margarita."

Summary

Obviously, playing with maps, learning about egg beaters, or taking walks into the community will not teach children all of the conventional knowledge about history or geography. Nor will it give them a full experience of how to participate in a democracy. Nevertheless, it is through these early explorations that children develop everyday concepts, or embryonic knowledge, of themselves and their social world. Vygotsky explained,

> *An everyday concept clears the path for the scientific....It creates a series of structures necessary for the evolution of a concept's more primitive, elementary aspects, which give it body and vitality. Scientific concepts grow down through spontaneous concepts; spontaneous concepts grow upward through scientific concepts (Vygotsky, 1962, p. 109).*

Regardless, these elementary concepts do not develop automatically through children's explorations with their world. Without the sensitive interaction of an adult who gives children verbal labels; extends their experiences with reference materials, books and pictures; and continually asks them to question, speculate, and reflect on their experiences and reach conclusions, it would be unlikely that children would learn concepts from social studies. To do this, it takes a teacher who understands what children already know and who appreciates what they are capable of comprehending at their developmental level. This teacher can then capitalize every day on their capabilities, building on naturally occurring experiences as well as extending, expanding, and clarifying children's existing concepts as a way of increasing their understanding of and appreciation for the world and people around them.

Sample Lesson Plan: A Personal Perspective on Time and History

Objectives

Through this activity students will:

- Explore how events in a sequence are related, using timelines and personal artifacts.
- Understand how one event brings about change in another.
- Appreciate how past events can be used to predict future ones.

Materials

- Meter-long strips of paper
- Markers
- Tape
- Pictures of the children in the class as babies
- A card on which the children have gathered the following information: their birth date, birth weight, and length at birth
- Current pictures of the children
- Basic materials such as paper, paint, glue, clips, pens, and pencils

Procedure

1. Ask children if they know any stories about themselves when they were babies.
2. Find out what is their earliest memory.
3. Encourage a discussion of these early times in their lives.
4. Invite parents to come in and share stories from their child's early days. They might be encouraged to bring in a baby sister or brother for a visit.

5. Encourage the children to make observations about changes that have taken place in their lives over time.

6. Explain that one way of showing changes in history is called a timeline. Tell them that they will be making a timeline of their life from birth until the present. Discuss what are the significant events that they may want to include.

7. Give each one a meter strip and ask them to note on it their birth dates and other information about when they were born such as weight and length. Have them add other significant information such as their first spoken word, when they lost their first tooth, when a sibling was born, etc.

8. Have the children share their personal timelines with the whole group before displaying them in the classroom.

Assessment

After completing this exercise, children should be able to:

- Demonstrate the sequential changes in their life and development.
- Understand the progress of growth.
- See that history is personal.
- Appreciate that everyone's development is different.

Additional Activities

- A variety of timelines relevant to the children can be made during the school year. A classroom timeline can record significant events that occur during the first-grade year. A timeline that represents changes and events that occur in the whole school community can be made. Historical timelines can be developed about different subject matters addressed in the first-grade curriculum such as the life-cycle of an ant, the history of flight, or the steps in bread making.
- Each child can make a book about themselves.

- Children can be asked to read a biography about a favorite personality or historical figure and then present a timeline of this person's life or achievements to the class.

- Have the children interview an older relative about their life experiences and then chart that person's life on a timeline to be shared with the class.

- Ask children to bring in interesting objects or artifacts that relate to a particular topic or theme. These might be borrowed from a family or interested community member. For example, a family might lend an old family picture album if the class is focusing on "families."

- Get children to find tools, instruments, and objects from other countries and cultures. They can share them with classmates and represent them on a relevant timeline.

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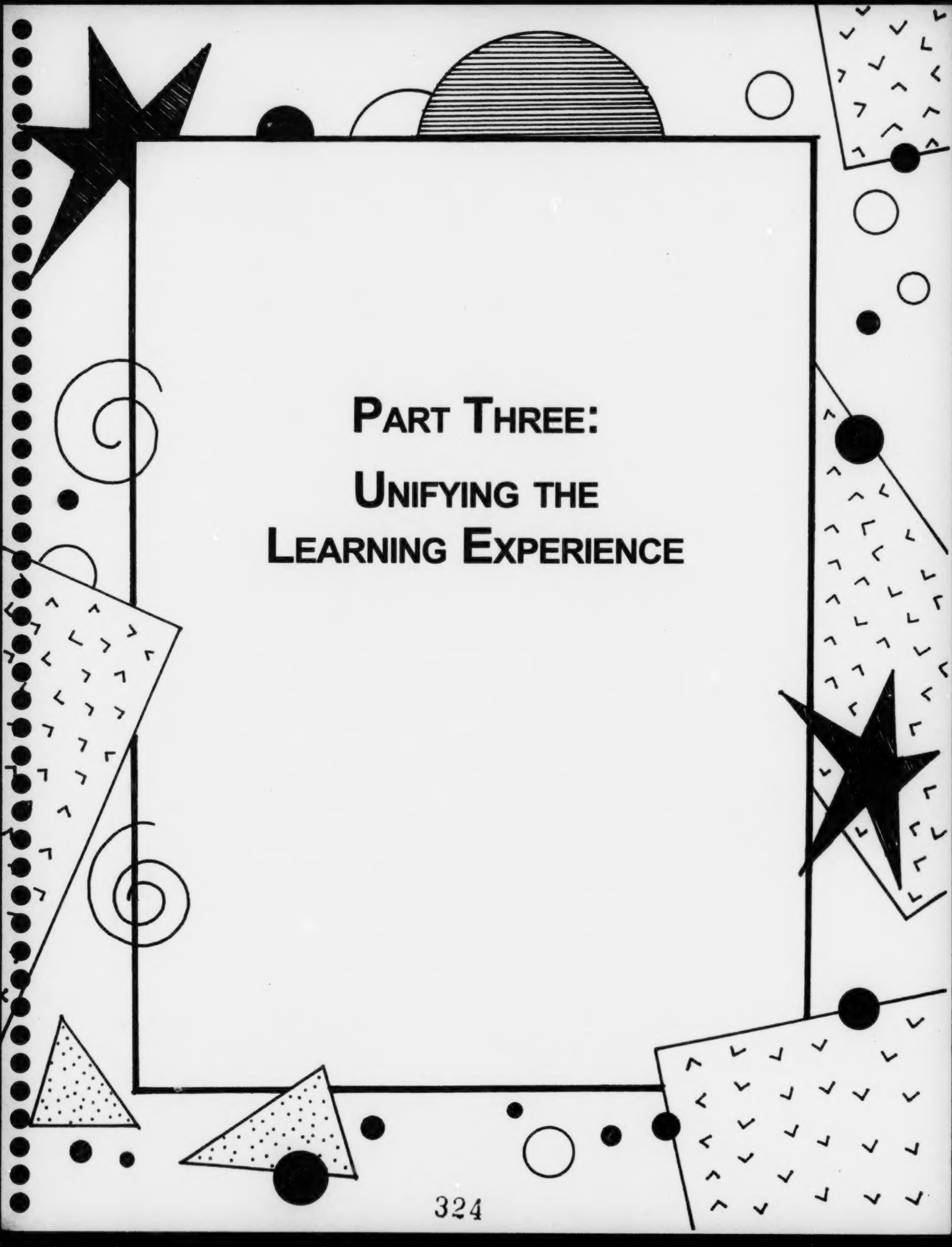
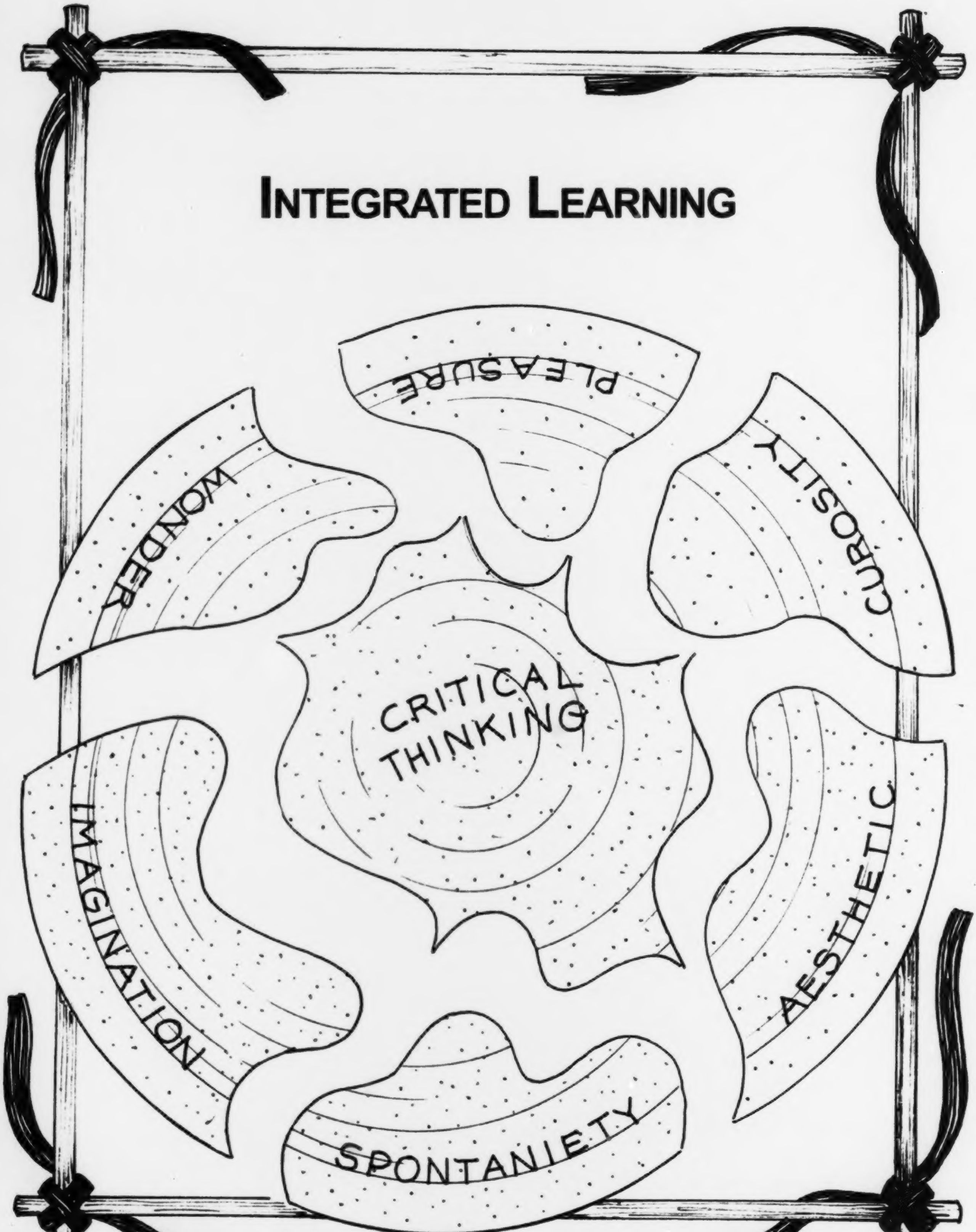


PART THREE:
UNIFYING THE LEARNING EXPERIENCE

INTEGRATED LEARNING


PLEASURE
CURIOSITY
AESTHETIC
SPONTANIETY
IMAGINATION
WONDER
CRITICAL THINKING

XIV. INTEGRATED LEARNING

Clasp the hands and know the thoughts of people in other lands.
John Mase Field

OVERVIEW

A significant goal of the Step by Step Primary Program is to nurture in children such characteristics as curiosity, wonder, imagination, critical thinking, spontaneity and pleasure in aesthetic experiences. These characteristics are universally possessed by children when young, but are often lost during the first decade of living. The Step by Step Primary Program teachers value these qualities because they influence the child's ability to grasp concepts and use ideas in original ways. As a child moves from the Step by Step kindergarten to the primary program, the teachers use the new methodology to support and cultivate these valued characteristics. Teaching through themes or thematic units is our way of achieving this goal. Thematic units, such as the study of bread described in this section, emphasize activities which call for independent thinking, reference to personal experiences, discrimination and decision making, initiative, resourcefulness, personal discipline, and cooperation.

> *Such unified focusing of conscious thought, feelings, and actions by the child tends to create a self-actualizing or "flow" experience deeply important for personality growth at emerging levels. (Csikszentmilialy, 1993)*

A thematic approach to teaching emphasizes the intellectual, social, emotional, physical, and aesthetic aspects of children's growth. Thematic teaching supports the simultaneous development of these areas rather than focusing on an isolated aspect which is unnatural for children's development. When teachers are aware of ways to design thematic units, they can empower children to use original, resourceful thinking. Teachers are able to encourage children to respond to the content being taught in meaningful and satisfying ways. Child-appropriate activities are planned to elicit the kind of thought and behavior which brings children a sense of competence and expectations for success.

Competent, successful children develop in stimulating, caring, environments. When implementing a thematic unit the teacher consciously creates ways to show children that the adults care for them and are excited about their learning. Teachers, parents, and teacher assistants guide the learning through conversations which focus attention and energy on content. They help to reach meaningful thinking through increasingly open and honest dialogue. This guidance enables children to gain thinking and language competencies and the self-confidence to find new ways of applying newly learned information.

Everyone benefits from thematic teaching. Parents are involved and aware as they share their expertise in a variety of areas in classroom activities. Teachers are stimulated by new content and exciting opportunities for new professional methodologies. Children are recognized as competent, original thinkers and allowed new ways of demonstrating their knowledge. The result of such an integrated learning model, when thoughtfully designed and implemented, can be the growth of a community of learners who:

- Care about each other.
- Make exciting intellectual connections.
- Develop habits of communication and dialogue.
- Build community.

Understanding Thematic Teaching

Thematic teaching involves integrating different curriculum areas by exploring an interesting idea which draws on content from varied subject areas. Thematic teaching arranges the curriculum so that students see the connections among different subject areas and the relationship of these areas to life. Thematic teaching which develops a number of subject areas requires teacher planning and cooperation. For example:

> Using the rain forest as a theme, the students can learn math and geography skills as they solve such problems as calculating how far the Brazilian rain forest is from their home and how long it would take to travel to the rain forest. They can study the animals and plants and practice their writing skills by developing stories about visiting the rain forest and writing post cards to send home from this imaginary adventure.

Thematic teaching allows the teacher to organize the curriculum around topics, problems, or essential questions that children find engaging. It offers another way to present curriculum content other than instruction based specifically on one discipline. It is interdisciplinary, as is life and the situations it presents us with. This fact is immediately significant to children when they are presented with a "real" problem to solve or a new idea to explore. Projects and theme studies are not new ideas in early childhood education.

> *The Bank Street model, the Plowden Report and British Infant schools, Open Education, the Piagetian-based curriculum, Dewey's ideas on thematic activities, Carolyn Pratt's discoveries about children's learning, hands-on science teaching, - all these and more from early education rich heritage reflect aspects or features that are in effect when children engage in project learning. . .all place the child at the center of curricular practice (Webster, 1990, p. 2).*

The notion of keeping the children's interests central in designing a theme study or project ensures that the children will be motivated and invest themselves in the learning. Most children enjoy projects which appeal to their interests unlike the dullness of workbook sheets. In planning a thematic unit of study, a teacher should consider the following questions:

- Are the themes developed in response to the children's questions?
- Do the themes encourage imaginative, creative thinking?
- Can the chosen theme be managed in ways to allow multi-levels of involvement and challenges so that each child experiences success?
- Will the children have to draw on basic academic skills to implement the projects involved in the theme study?
- Will there be opportunities for social cooperation and responsibilities as the children work on the project?
- Will children have opportunities to increase their knowledge and experiences with objects, people, and events in the world around them?
- Do the projects reflect children's attempts to construct their own understanding and interpretations of new information?

There are three essential elements of theme teaching. They are: Teacher Planning, Mini Lessons, and Cooperative Learning. These are common tools for teachers in structuring learning situations for children.

Teacher Planning

During the planning phase of a thematic unit of study, these questions should be considered:

- What are your learning goals for the children?
- What do you expect each child to accomplish?
- What skills are you focusing on?

By answering these questions, you will define the goals for the specific theme being taught. Once these have been answered, plan to:

- Select a theme to be developed with the children.
- Communicate the selected theme and goals to parents in an introductory letter.
- Ask for their participation, assistance, and expertise.
- Make sure the themes reflect an interest of the children's and are age appropriate.
- Plan the length of time to be dedicated to the theme study, allow extra days for final projects.
- Plan ahead for resources that will be needed, for example: informational and story books, experts who may be able to come to class and speak about the topic, other sources of information.
- Develop a calendar of activities in your plan book. Based on your plan book, make a theme calendar with the children in class.
- Develop a theme based curriculum web showing the concepts that will be developed. (See two examples at the end of this chapter.)

Mini Lessons

Teaching the following skills helps ensure student motivation and ownership of learning in theme work:

How to write a letter to obtain information. Plan large group and small group instruction in letter writing at the beginning of the theme unit.

How to ask questions to obtain information. Practice role-playing telephone interviews or in-person interviews with experts. Children should think of their questions ahead of time and write them.

How to take notes. Talk about why people use notes to help them organize information.

How to write a simple report stating the most important facts.

Cooperative Learning

Cooperative learning is a method of instruction in which students work together in small groups to achieve a common goal. The goal may be to solve a problem, investigate an issue or practice a skill that is directly related to a topic that students are studying. Some guidelines for cooperative learning:

- Make sure that children work in heterogeneous, cooperative groups for the duration of the theme.
- Allow the children planning time together. Teach strategies for brainstorming and sharing ideas.
- Design expectations for various content areas, within a developmental range that assure success for all students.

Summary

The essential elements of thematic planning are: Teacher Planning, Mini Lessons, and Cooperative Learning. The benefits of thematic teaching for both teachers and students are:

- increased student understanding
- connections that students make among content areas
- increased student motivation
- more enjoyable teaching
- a broad as well as an in-depth exploration of a topic that is age appropriate.

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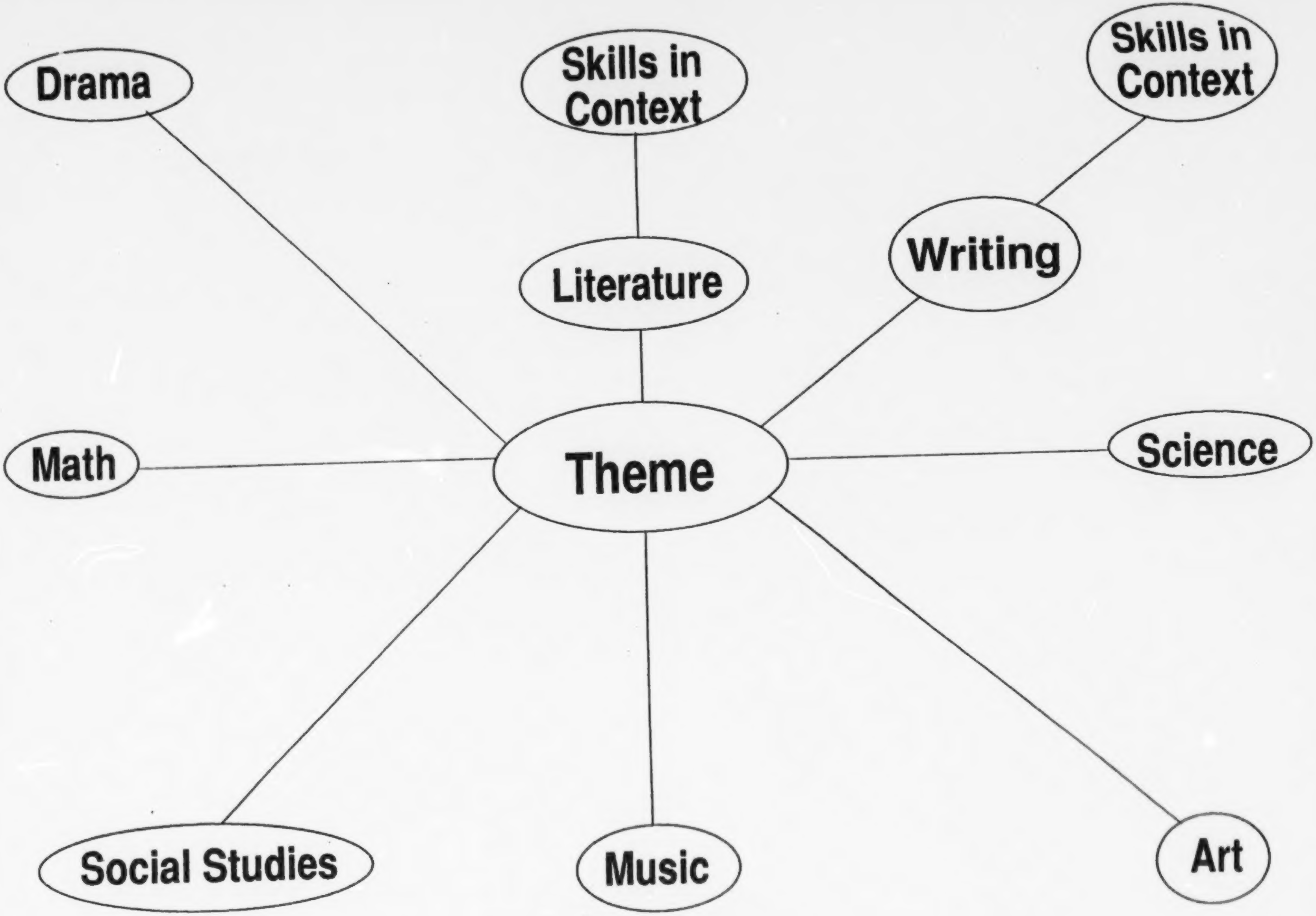

Drama
Skills in Context
Skills in Context
Literature
Writing
Math
Theme
Science
Social Studies
Music
Art

From *Why Whole Language*, by Jay Buros.

Jay Buros

Bears

Drama

- — Act out "The Three Bears"
- — Puppet show / sock puppets — *Hairy Bear* (The Wright Group)
- — Act out jumprope chant *Teddy Bear, Teddy Bear*
- — Puppet show on tongue depressors of "The Three Bears" or *Ask Mr. Bear*

Skills in Context

— Depends on grade level. —

Skills in Context

Literature

See books on bears, next page.

Writing

- — Photograph child with animal. Write about picture.
- — Have children write letters to Teddy bears inviting them to school.
- — In a Teddy bear shape book have children write about their bears.
- — Write a Teddy bear story as a group. Innovate on text or pattern book.

Math

- — Teddy bear counters (little plastic bears)
- — Teddy Grahams
- — Actual Teddy bears
- — Teddy bear macaroni

count estimate
group weigh
pattern measure
graph word problems
add/subtract
multiply/divide

Science

- — Make Teddy bear cookies
- — Research the Teddy bear
- — Study real bears.
- — Make book on tracks in winter (great big book & small book)

Visitors:

- — Ask someone who makes Teddy bears to show class how they do it
- — Have a bear collector visit room and share collection.

Special Events:

- — Teddy bear parade in the entire school, teachers, too.
- — Bear Evening – put on plays, make clothes & enjoy.

Social Studies

- — Where did the name Teddy bear come from?
- — Interview grandparents about their favorite toys.
- — What kinds of toys did children play with in the olden days?

Music

Art

- — Children make small books (8½ x 11) *Teddy Bear, Teddy Bear*
- — Map story of the three bears.

Jay Buros

Trees – Ecology

Drama

— Rap song —
Recycle Mania / Billy B. Sings about Trees

Skills in Context

Literature

Read:
- *The Man Who Planted Trees* – guided reading
- *My Earth Book*

— Depends on grade level. —

Skills in Context

Writing

- Web a story
- Map stories
- Brainstorm names of trees.
- Design a poster that you would carry in a protest march.
- List names of trees that give fruit.

Math

- Survey the grocery store and count how many shopping bags are used in one hour.
- Homework survey — ½ hour; go to a grocery store and count how many paper bags are used by customers.
- Recycle aluminum cans — count by hundreds — thousands.
- How many cans do you need to make a pound?
- How much money could the class make per pound?
- How many trees make 1 Sunday edition of the New York Times? Your local paper?

Science

- Talk about a recycle program.
- Observe a leaf / pine cone.
- Compare / observe apples.
- How long does it take garbage to break down?

Game:
- About Ecology

Social Studies

- Game — How much of the world is water? Land? Chart on a graph.
- Identify where trees grow / what kinds.
- Name markers on a map, example: land, river, ocean.
- Play a game throwing a globe.

Music

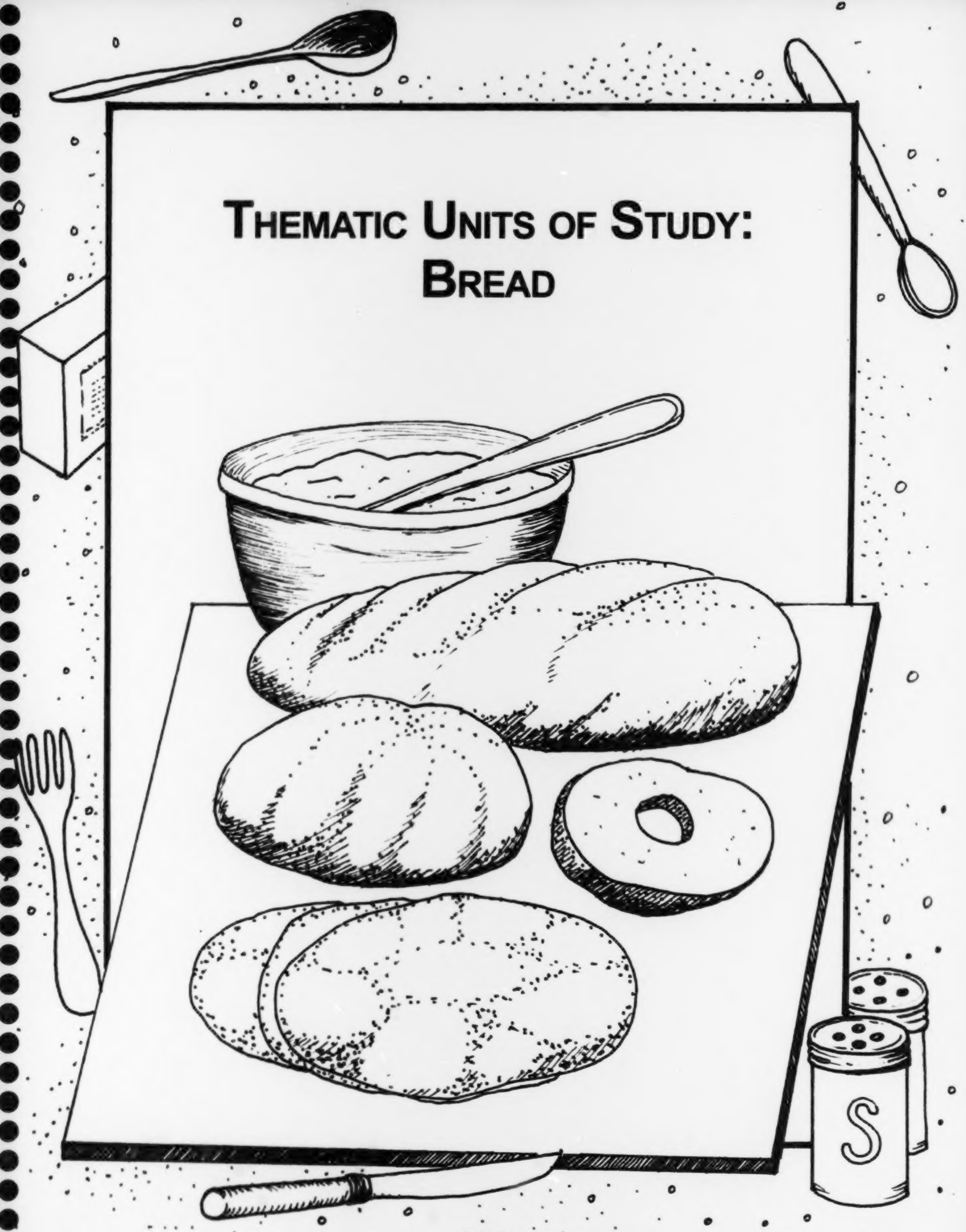
- *Evergreen / Everblue* Raffi (See drama.)

Art

- Design a poster to encourage recycling programs.
- Illustrate one way you can recycle today.
- Illustrate things in the world that are made out of wood. (Make into a tree mural.)

Jay Buros

THEMATIC UNITS OF STUDY: BREAD



XV. THEMATIC UNITS OF STUDY: BREAD

> *The more a child has seen and heard, the more he wants to see and hear.*
>
> Jean Piaget

Young children spend much of their time trying to make sense of the world around them. Natural curiosity leads children to ask questions, investigate, and relate past experiences to new situations. This type of inquisitive approach to life is appreciated and promoted by the Step by Step Primary Program.

Building on the natural curiosity of the child is one of the teachers' primary jobs. A very effective way of doing this is to develop, with the children, projects for further investigating their areas of interest. This chapter presents examples of in-depth studies which investigate all aspects of a subject through the traditional content areas.

Bread

Bread is basic and familiar to all children. It is a common element in their lives. Bread comes in a variety of shapes, sizes, and types relating to different cultures, religions, and backgrounds. It is a part of everyday experience as well as important celebrations. Children may wonder about making bread, or where their bread comes from, or how bread comes to be in different forms. These questions are key to initiating an investigative project to answer their queries.

Using bread as a vehicle for integrating content areas is very successful in the classroom. For example, children can explore science concepts such as change and growth through the study of bread. It affords the children and teachers opportunities for discussions, observations, and experiments. Bread lends itself to the exploration of many concepts in history, geography, or social studies. Children can learn history by finding the origins of bread ingredients in a particular region or country. For example, bread is common to most cultures, yet it comes in many different forms. The class can make a map showing the origin of these breads and a time line showing when they were first made. These differences allow discussions of the different cultures, religions, families, and celebrations.

People in various cultural and religious groups throughout time have used bread in remembrance of events in history. Bread is linked to the Christian and Jewish heritage, culture, and religion. Challah and matzah are two traditional Jewish breads. Challah is a

Sabbath braided bread eaten in homes around the world. Matzah, an unleavened bread, is eaten by Jewish families during Passover to recall their quick exodus from Egypt. A Christian tradition describes how a monk baked hot-crossed buns to sell on Easter and another tells the story of a poor man in the Vatican who made pretzels for the poor. The children can bring to class their family recipes for breads served at celebrations and share stories about the celebration or family occasion. Additionally, children can learn about the jobs of those whose work is essential in the production of bread. They can learn about the baker who provides a useful service to the community.

Mathematics can also be taught using bread as the unifying concept. Estimating, measuring, recording ingredients, graphing, surveying, and computation are some of the mathematical functions that can be taught doing class projects on bread.

A bread unit provides many opportunities for reading and writing, such as writing thank-you notes after field trips, making information books, writing recipes, making lists of ingredients that are needed, and inventing creative stories or plays. There are folk tales and literature about bread in many cultures which children can hear. Comparing a variety of versions of a particular story is a valuable literacy experience.

Art, music, and movement activities can be woven into the unit in response to the children's ideas.

Background Information

Many different people participate in the process of "bringing bread to the table". The farmer grows the wheat. The miller grinds the wheat into different types of flour. The baker bakes the bread and the delivery person brings it to market where it is purchased. From planting the wheat to baking the dough, the production of bread involves many steps in a complex yet specific process. Studying the changes involved in bread making helps children learn about sequencing, logical methods, and process.

The production of different kinds of bread, that is bread associated with particular cultures, involves the use of different ingredients. Although the fundamental ingredient in bread is wheat, the wheat undergoes many changes before it takes its final form as a loaf. Different ingredients affect certain changes involved in making bread. Environmental factors (such as air and water) also affect the growth of wheat, the rising of dough, and the production of different bread types.

Exploring Change, Universality, and Variety

Three major concepts which can be explored using the bread unit are change, universality, and variety. By investigating the many aspects of bread, children will broaden their understanding of these basic concepts. By using a concrete object such as bread which is familiar to children from their daily experience, the teacher can build a bridge to abstract concepts such as change and variety.

Children will see change as wheat plants grow from seeds into tall plants and grain is ground into flour. These activities can be done at school or through a family's involvement. In addition, change is visible when yeast breaks down sugar and generates carbon dioxide. They will also see changes that occur when one alters the temperature of the water or the other ingredients mixed with yeast to form dough. Change is very evident when they watch bread baking. And by experimenting, they can observe what happens to various types of bread when they are exposed to air and water.

The children will appreciate the universality and variety of bread by making and tasting bread from all over the world. The children can discuss their experiences making bread at home and those occasions when special bread is involved. Parents can come in to school and share family traditions and customs. The class can compare cultural celebrations associated with bread by considering the common elements found in specific celebrations among different countries. Making a questionnaire and surveying the whole school to determine bread preferences of teachers and students will help the children learn of the likes and dislikes of people in their community and the value of choice. Illustrating the results of the surveys by using graphs and charts will present the information visually so that the children can see variety of types, tastes, and the universal appeal of bread. Bread-related fictional books, stories and folk tales as well as informational books can be shared daily. (See the example on the following page for an overview).

All areas of the classroom will reflect the theme of the bread unit. The dramatic play area can become a bakery by adding items that are used for baking and cooking. The literacy center can have bread-related books added to it or stories that the teacher or class may write about personal experiences making bread. The writing center will have vocabulary cards containing words related to bread, wheat, and baking. It will also contain blank books ready for children to compose stories and cards to make into "bread menus". The math area will contain bins of flour and a wide variety of materials for measuring, weighing, and sorting as well as various sizes of containers and scoops. The art area will contain different types of grain, play dough, and clay. The science table should change regularly, holding on-going experiments as well as grain for sorting and wheat for grinding. Display areas both inside the classroom and in the hallways should show the children's work on the bread project.

A culminating group project is an important way to assess learning and provide a way for children to share their newly acquired skills and information. Some effective large group projects are:

- Making the classroom into a bakery where the children become the bakers and proprietors; other classes can be invited to come and "buy" bread. Children can make paper money for their customers and calculate the exchanges.
- An informational book about breads and how bread is made can be a whole class project.
- A play can be written or a folk tale adapted as a play.

Theme: Bread
Concept: Change, Universality, Variety

LANGUAGE ARTS

- Shares reading of poems—books about bread
- Write collaborative story about bread
- Write play about bread for class to perform
- Write recipes for bread
- Conduct school wide bread survey
- Write information book about process of making bread
- Discuss what we know and want to learn about bread
- Make bread books
- Make invitations to play

ART

- Make playdough
- Make grain collage
- Make posters and tickets for play
- Design bread menus for dramatic play areas
- Make baker hats
- Illustrate break books
- Make mural of field trip to bakery
- Make scenery for play

MATH

- Estimate number of slices in a precut loaf of bread
- Make number stories using bread
- Tally and graph results of bread survey
- Practice currency transactions for play and bakery
- Compare and categorize kinds of bread and prices of bread
- Estimate, then weigh different kinds of bread, compare and discuss results
- Count and compare how many scoops of flour different containers can hold

SOCIAL STUDIES

- Discuss how bread is special, i.e. celebrations, religions, family traditions, etc.
- Visit bakery or mill
- Taste and discuss the differences and similarities of bread from other cultures and traditions: Irish soda bread, pita, matzal
- Make a grinder or mill; discuss technology and changes in bread making process
- Research history of bread making, interview grandparents
- Visit and research different people's jobs involved in making and selling bread
- Bread as basic to all people, nutrition

MUSIC MOVEMENT

- Act out dough rising
- Act out sequence of grain to bread process
- Pantomime making bread kneading, rolling, etc.
- Make up a song about bread
- Create rhythms to compliment the specific parts of the bread process
- Make up a bread dance
- Act out bread story, and perform the class bread play

SCIENCE

- Examine and observe wheat berries, wheat germ and bran
- Grind wheat berries: (rocks, morter and pestle)
- Plant wheat seeds and record growth
- Do experiments with yeast
- Conduct mold experiments
- Make models of wheat berries
- Make a variety of breads
- Compare reaction of baking soda and baking power when mixed with water
- Nutritional aspects of bread

Bread is part of most children's daily life experiences, therefore it is something that they can relate to. Making and serving a wide variety of breads from different cultures helps build an awareness of the universality of bread and the connections that we all share in simple ways.

By involving the whole class, children are given opportunities to recognize all they have learned. They come to depend on each other as they work in cooperative groups toward a common end, and because their ideas are incorporated in the lessons and projects they are intellectually and emotionally invested in the learning.

Thematic units based on broad concepts such as change and variety, which are taught through concrete processes like bread making, offer many possibilities for real understanding on the part of the learners. Thematic teaching helps children make connections and appreciate the inter-relatedness of life. Thematic teaching helps teachers address the various learning styles in a class of diverse children. It allows for greater flexibility in content planning. Specific themes lend themselves to a greater variety of hands-on and multisensory activities which help children understand abstract concepts. Themes offer both teachers and students more creative possibilities of responding to ideas and materials.

Research has shown that when many different "ways of knowing" or learning modalities are combined, understanding is enhanced (Gardner, 1991). The Step by Step Primary Program encourages teaching for understanding. Thematic teaching is a way to achieve that goal.

When children ask questions, search for answers, investigate, discuss, and present their conclusions they are actively involved in the learning process. They are thinking critically, negotiating, cooperating, and compromising. They acquire new knowledge about themselves, their peers, and the world around them. In-depth study of a topic brings it alive for children; they can realize the benefits of pursuing ideas and questions to deeper levels of understanding beyond the superficial. Being fully engaged in a group project helps children experience the benefits of communication, caring, being part of a community, and making connections.

General Objectives in the Thematic Unit on Bread

- Appreciate the similarities and differences in cultures.
- Appreciate the part bread plays in daily experiences of people as well as in their celebrations and festivals.
- Recognize the need for various types of workers in the production of bread.
- Summarize the process by which wheat becomes bread.
- Appreciate the significance of science in the production of bread.
- Classify breads as leavened or unleavened.
- Demonstrate problem solving skills in the context of the projects.
- Construct, read, and interpret a variety of graphs.
- Record information in tally form.
- Measure with non-standard units of measurement.
- Record observations.

- Interpret stories and dramatize at least one story.
- Follow a recipe.
- Demonstrate good listening and communication skills.

These Sample Lesson Plans are presented to demonstrate how specific subject areas, such as science, mathematics, literacy, and social studies can be addressed through thematic units of study.

Sample Lesson Plan: Sequencing from Grain to Bread

Content Areas Involved:

Literacy
Drama/ Movement
Social Studies
Mathematics

Objectives

- To develop an understanding of the steps involved in making bread (from planting the wheat to putting the dough in the oven).
- To be able to sequence the process from grain to bread either with pictures, dictation, or invented spelling.
- To appreciate the role of professionals involved in the production of bread.

Materials

- The book, *From Grain to Bread*
- Chart paper
- Marker
- Paper divided into eight blocks or squares, numbered from one to eight
- Markers, pencils, crayons for writing

Background Information

The class can take a field trip to a bakery or bread making company so the children can see the process of how bread is made: from the wheat berries being ground into flour to the loaves being put in the oven. The children record their trip in a variety of ways. They can draw or paint their favorite part of the trip. Materials can be added to the dramatic activity area to create a bakery. Teachers can supply boxes, dowels, and cardboard for the art area for the creation of a wheat grinder. A model bakery can be replicated in the block corner.

The teacher reads to the whole class the book, *From Grain to Bread* by Ali Mitgutsch.

Procedure

1. During Morning Meeting, the class discusses their trip to the bakery. Encourage children to tell what they thought about the bakery; what they saw that was a surprise to them; and new ideas that occurred to them.

2. After the children have finished sharing their responses, the class will list the steps that they recall are involved in making bread. Guide the group through this process while the teacher assistant lists the steps on chart paper which is hung so everyone can see.

3. Highlight significant words with colored markers to emphasize relevant vocabulary.

4. Reread *From Grain to Bread* and ask the class to compare the list they remembered to the sequence in the book.

5. Let the children choose partners and dramatize the events. One child acts as the grain, dough, and bread while the other partner plays the part of the farmer, baker, and delivery person. Narrate the story and, once the sequence is complete, the children reverse roles.

6. Ask the children to remain seated in a circle in the large group area as you distribute the paper for the sequencing project.

7. Ask the children to draw in the boxes the steps of sequencing grain to bread. Uses the terms "first," "second," "third" to emphasize ordinal numbers.

8. Let the children find a place in the room to do their work; they are encouraged to ask a friend if they have trouble remembering the sequence.

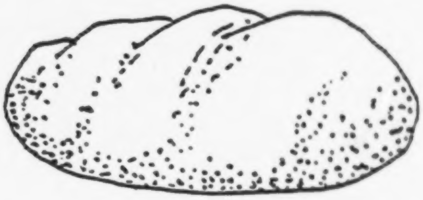
9. Once the children have drawn the pictures, give them two choices: they may write the steps independently or dictate the steps to an adult. If some children do not choose to draw the pictures, they may write the words only. Accept their attempts at spelling the words. The children are not expected to finish the activity in this one time period. They may choose to complete it in free choice time.

Assessment

The pictures and written steps of changing grain into bread will indicate what the children have learned about this process through this activity.

Additional Activities

- The class can make bread with the help of parent volunteers.
- A collaborative story about the class' bread-making experience can be written with the class members as the characters.



Sample Lesson Plan: A School-Wide Bread Survey

In this lesson, the children determine the bread preferences of the whole school by doing a survey.

Content Areas Involved:

Mathematics
Literacy
Social Studies

Objectives

- To determine the bread preferences of the whole school community.
- To develop ways to record information.
- To build a graph of unifix cubes showing the results of the survey.
- To transfer data from survey sheet and unifix cube/graph to a two dimensional graph.
- To count by sets of five.

Materials

- Survey sheets
- Pencils
- Clipboards
- Lists of classes in the school and administrators
- Unifix cubes
- Cards listing various breads
- Large paper graph on hallway display board
- Strips of one meter paper
- Markers
- Glue stick

Background Information

During Morning Meeting, taste tests are conducted on various kinds of bread. Each time a type of bread is tested, a discussion takes place about the country of origin, what the bread looks, tastes, feels, and smells like. The children are asked to predict if they think most of the children will or will not like the bread. These predictions are recorded in a tally form (that is by using groups of five strokes) on a large piece of paper. After the predictions are recorded, the children taste the bread, discuss their reactions to the taste; one child has the job of recorder to tally the results and does so. Questions are asked about the results:

> Did more people like the bread than not?
>
> How many people changed their opinion from the initial prediction?

Each child should have the experience of recording the tallies. This prepares them for the school- wide survey.

Procedure

1. Introduce the concept of a whole school survey about bread at Morning Meeting.
2. Ask the children to suggest the types of bread to include on the survey based on their list of breads they have tasted. The survey will include six kinds.
3. Tell the children that in pairs they will go to different classes in the school and ask each person which bread they prefer. They use tally marks to record their responses. They are to ask each teacher if the time is acceptable and return later if it is necessary.
4. At group time, let several children play at being the surveyor, the teacher, and the students being interviewed about their preference. This allows them to practice and feel ready.
5. Arrange for the children to conduct the survey during free choice time.

6. When they return to class, they will transfer the tally marks to the corresponding number of unifix cubes in a three dimensional graph, color paper squares and glue them to a graph on the board. These graphs become teaching and learning tools as observations, predictions, and comparisons are made daily as the children construct the graphs. This project may continue until everyone in the school has participated.

7. Once the activity is complete, the children summarize the findings determining which bread is most popular.

8. Help the children prepare the final results and distribute them school wide.

Assessment

In determining the learning that took place, the following questions can be asked :

Did the children understand the purpose of the project?

Could they carry out the task?

Were the tally sheets done clearly and in groups of five?

Were they motivated and enthusiastic about the project?

Additional Activities

Use the survey format with other projects.

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A good society, one that encourages individuals to realize their potential and permits complexity to evolve, is one...But the task for a good society is not to enshrine the creative solutions of the past into permanent institutions; it is rather to make it possible for creativity to keep asserting itself. Its task is to give people a chance to ring forth new cultural information to be evaluated, selected and joyously implemented by informed, free and responsible peers.

Mihaly Csikszentmihali

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